THE Chemical Exposition has taught us the value of "horn-blowing". In the past, Plastics had been content to confine its back-slapping efforts to its friends in the industry, sublimely overlooking the fact that a little personal bombast may be the elixir of success. At the present time, that theory has gained additional impetus. Three publishers—one of whom is flatteringly referred to as a competitor (vain boast!)—had the kindness to congratulate us on Plastics, on the booth, on the field, on everything, in fact, with which our existence is so tightly bound. Hereafter we shall take numerous occasion to proclaim our strong and independent position, not only to prospects, but as a criterion for our present advertisers.

The exposition also taught us the value of figures. As one man said, when he stepped in our booth, "I don't know what Plastics are, but I'm interested in $219,000,000!" And he subscribed! (along with many others). Figures, in advertising, can be extremely uninteresting but there are ways of making them talk. Another hint for advertisers.

And another thing. There were more plastic manufacturers there than ever before. One or two other things being equal (see our Editor's comment), the molders,—if you'll pardon another tip—should certainly have a joint exhibit of some sort at the next show two years hence. Public opinion, and especially chemical interest, is centered on these composition materials, and they need only to be shown how? and why? in order to go where? to shop. Thereby raising the two hundred million.

It would be exceptionally advantageous if all the exhibitors from this industry should get together well in advance next time and hire adjoining space. Then the "paper" figures could be concretely demonstrated by industry representation.

The Publishers

PLASTICS
& MOLDED PRODUCTS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 5 JUNE, 1929 No. 6

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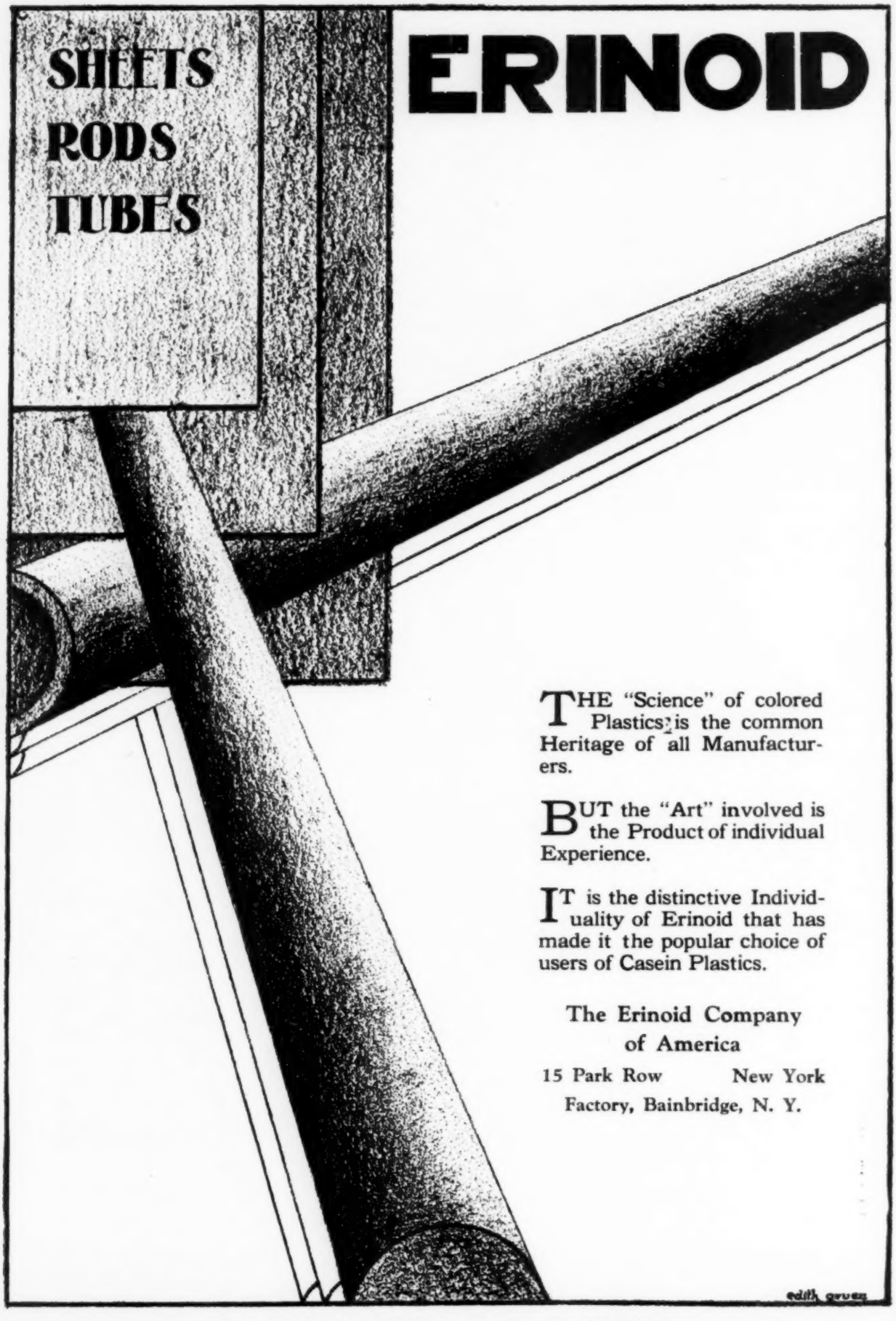
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PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 5 JUNE, 1929 No. 6

Light and the Resinoid Plastics

A resume of what has been accomplished in the production of artificial resins resistant to light without material darkening

By Charles W. Rivise

CONTINUING from page 268 of the May issue we find that:—

German Patent No. 222,543 describes the use of glycerine together with acid or acid-yielding substances for accelerating the hardening of the condensation products. This was solely a disclosure of the acceleration of the hardening by addition of glycerine together with acid or substances producing acid reaction. The present invention consists in the use of an alkaline glycerate, without acid and not capable of being used together with acid. The addition is solid, whereas glycerine is liquid. A clear, bright resin is obtained, much lighter in color than that produced with glycerine, and its color is constant. Moreover the advantage is obtained that according to the proportion used, which is considerably smaller than that of glycerine, the brittleness is reduced and the toughness increased, or with a larger proportion of the alkaline glycerate the melting point is raised and the solubility in solvents reduced or wholly destroyed.

In the May issue we brought another portion of this revue which is now continued. The present article describes quite a number of different methods employed to effect the complete condensation of phenol with aldehydes.

Extract from Patent 1,475,446 to Pollak and Mohring

"According to the desired hardness of the finished product, a molecule of phenol or of one of its homologues is mixed with 1, 2 or 3 molecules of formaldehyde and a small quantity of organic acid is added acting as a condensation means, the best acids being mono- or polybasic carboxyl acids, (although others can be used) the "amount of acid used being such, that the separation of the resin takes place after 8 to 12 hours boiling. As soon as the mixture begins to become cloudy, a volatile organic base is added; also some ammonia may be used. The amount of the said base should be such that the point of neutralization is only slightly passed.

"The boiling is continued for another 2 to 5 minutes, cooling is allowed to take place, washing is effected several times with distilled water, the moist reaction mixture is subjected to distillation in vacuo which is continued until the mass becomes entirely clear, a small quantity of volatile base is again added, and a further distillation in vacuo is effected until only a very small quantity of liquid passes over. The resin which has been so treated is now hardened at a temperature of 70 to 110° C. with or without pressure. In the appended claims, 'a simple phenol' is intended to embrace phenol, C_6H_5OH, as well as its homologues. Also the expressions are intended to embrace both 'mono-oxy' and 'poly-oxy' compounds. The term 'methylamine' includes mono-, di- and tri-methylamine. It is to be understood also that many other volatile bases can be substituted for these.

First Example

100 grams of phenol, 100 grams of formaldehyde (40 volumes per cent), 1.9 grams of salicylic acid (this amount may be varied more or less.)

These quantities are boiled in a vessel having a reflux-cooler until the mixture becomes

creamy, which occurs in ten to twelve hours.

6.5 c.c. of dimethyl amine solution containing 153 grams of dimethylamine per litre are added, the boiling is continued for an other three to five minutes, the resin is washed several times with distilled water and is distilled in vacuo after which to each 100 grams of resin 75° C. up to 7 c. c. of a 1% ammoniacal solution are added.

The resin is then distilled over until small traces only of fluid pass over.

The resin is now hardened at a temperature of 75 to 110° C. with or without pressure. The specific gravity of the hardened resin is 1.274.

Second Example

100 grams of phenol, 100 grams of formaldehyde (40 volumes %), 2.5 grams of salicylic acid.

The reaction and its further treatment takes place as described in the first example. However, instead of 6.5 c. c. of dimethyl amine solution, 8 c. c. of the solution of the same concentration are added. The specific gravity of the resinous product obtained is 1.287.

Third Example

"100 grams of phenol, 240 grams of formaldehyde (40 volumes %), 3.2 grams of salicylic acid, are condensed as above. The reaction and its subsequent treatment are carried out as in example 1; however, instead of 6.5 c. c. of dimethyl amine solution, as in the first example 11 c. c. of this material, of the strength above stated, are added. The specific gravity of the product obtained is 1.27.

Extract from Patent 1,472,353 to Byrom

It consists in the use of sodium thiosulphate $Na_2S_2O_3$ $5H_2O$ (commercially known as sodium hyposulphite) or other neutral salt of thiosulphuric acid $H_2S_3O_3$ as the catalytic or condensing agent.

By using sodium thiosulphate as the catalyzer, light coloured using commercial cresylic acid products are obtained even or carbolic acid at a temperature ranging from 90° C. to 115° C. with a minimum amount of formaldehyde viz:—40% to 60% of 40% formaldehyde by weight of cresylic acid.

The process is fairly rapid after the temperature of 90° C. to 100° C. is obtained, the reaction taking place gradually and is easily controlled, until the desired products are obtained; which takes place in a few hours.

The products formed are stable, not being affected by light or air; they are light coloured, soluble in alcohol, and can be used as varnishes for a variety of purposes. The products without dilution with solvents are easily incorporated with filling materials, and can be hardened by heating under pressure, or without pressure, to a temperature varying from about 140° C. to 200° C. producing compounds which are very hard, being insoluble in almost all solvents, such as water, oil, benzine, dilute acids, and alkalies. These hardened products are very suitable for electrical insulation and other purposes.

The invention is not confined to any particular proportion of sodium thiosulphate, but it is found to be advantageous to have an excess of the amount required to bring about the reaction; the excess may be used over again for treating further quantities of the phenols.

The process may be carried out in any suitable vessel such as for example an iron vessel preferably enamelled, of a conical shape fitted with outlet pipe having a valve at bottom, heated by direct heat or steam jacketed, or fitted with a steam coil, the vessel is fitted with a cover preferably water jacketed to prevent escape of the fumes, and also any loss taking place during the preparation.

The following example illustrates the manner of carrying out the process:—

"To 112 lbs. of cresylic acid (98% purity) free from sulphur compounds are added 72 pounds of sodium thiosulphate and 16 pounds of 40% formaldehyde. The mixture is heated to about 115° C. and maintained at this temperature for a period of about two hours, there being added at intervals of half an hour 16 pounds of 40% formaldehyde until the amount of 64 pounds of formaldehyde has been added. During the last half hour or thereabouts the temperature is lowered to about 110° C. and maintained at this temperature until the reaction is complete which is ascertained by taking samples and cooling in the usual manner, until the desired consistency is obtained.

It is important during the preparation to avoid having any excess of formaldehyde over the amounts previously stated, as products are liable to be formed which are insoluble in alcohol, and too hard for practical application. The condensation products prepared as thus described can be made to a varying degree of consistency, from a clear fluid product up to a plastic, or a solid state, according to the duration of treatment.

The finished product is separated from the aqueous salt solution by opening the valve of outlet pipe at the bottom of the vessel, and running off into another vessel for subsequent use, the valve being closed when the condensation products commence to run through. The contents of the vessel is then reduced to any desired strength with alcohol, or after cooling, run off without diluting into other vessels for subsequent treatment.

By a similar method of procedure, pure phenol, or the liquid carbolic acid, or a mixture of carbolic acid and cresylic acid may be employed."

Extract from Patent 1,483,368 to Mehta

"The molecular proportions of phenol and formaldehyde are taken and there is added potassium hydroxide and ammonia in

amounts equivalent to about 0.1083 parts of potassium hydroxide and one part of ammonia to 65 parts by weight of phenol. Glycerine is added in amount from 2 to 10% of the mixture. The mixture is put into rectangular pans and heated under a vacuum corresponding to about 29.5 or 30" of mercury at a temperature between 110° C. and 120° C., for example, by using steam under pressure as the heating means. The heat is continued until the mixture has changed into an oily liquid, say about six hours, after which the liquid is filtered and poured into molds and the heating continued under a similar high vacuum, for example, about 1 hour, after which the vacuum is reduced to from 1 to 15" and the heating continued for a further period, for example, of 2 hours until the product solidifies.

"The solidified product is then heated to about 150° C. to give the final product.

I find the use of a proper amount of glycerine is important in giving the desired product. In general, the amount of glycerine added should be from 1 to 10% of the mixture. Less than 1% tends to give an opaque product while with about 1% the product may be translucent but not clear and transparent. With 2 or 3% or more and up to about 10% clear products are readily obtained. More than 10% of glycerine tends to make the product hygroscopic. While I do not wish to limit myself by any explanation of the action of the glycerine yet I believe it acts to combine with small amounts of water and perhaps with other ingredients to hold them in a combined form in the product. Most of the water is removed during the heating under vacuum. At first the removal of water takes place rapidly but after about 6 hours in the process of the above example, only slow formation of bubbles takes place. The function of glycerine appears to be to take care of the small amounts of water that are not removed by the vacuum and accordingly I use a sufficient amount of glycerine to give a clear product without using such an excessive amount as to make the product hygroscopic."

"Instead of using a very small amount of caustic potash, a much larger amount can be used. For example, an amount corresponding to about 112 parts of potassium hydroxide to 65 parts of phenol, with the same proportion of ammonia given in the above examples. With this larger amount of caustic potash the process is carried out in a similar way to that above described, the heating being continued under a high vacuum, for example, for about 4 hours, the product then being put in a mold and maintained under a high vacuum for about 1 hour and then heated for a further period either under a lower vacuum or at atmospheric pressure. The amount of glycerine may be the same as with a smaller amount of caustic potash. The yield is somewhat higher with a larger amount of caustic potash than with the amount given in the above example. The product is finished by heating it to a temperature of about 150° C. to complete the final hardening, this final heating being either at atmospheric pressure or better under a vacuum."

Light Sensitive Resins Suitable For Photographic Purposes

Curiously enough, not all the workers in this field have considered the light sensitivity of the artificial plastics to be a serious shortcoming of these otherwise useful products. In fact, a small group of indefatigable research workers consisting of Murray C. Beebe, Alexander Murray and Harold V. Herlinger have directed all of their efforts towards the augmenting of this property and its utilization in entirely new and previously unthought of applications. Their resourcefulness has resulted in about a half dozen patents, all directed towards the utilization of what they term variously as photo-condensation, photo-oxidation, photoresinification and photo-polymerization in the decorating of metallic of other surfaces and the preparation of screenless photolithographic plates, and half tone process plates and intaglio printing plates. They do not limit themselves to any particular type of plastic. For example in Patent 1,587,269 dated June 1, 1926 they utilize the condensation products of the five membered monoheterocyclic compounds such as furfural, furfurane, pyrol or thiosphene with aniline, acetone, ammonia, ethyl ketone, alpha naphthylamine, sodium hydroxide, hydrochloric acid or sulphuric acid. In Patent 1,587,272 dated June 1, 1926 they disclose the possibility of using the condensation products of phenol and formaldehyde, dimethyl aniline and benzaldehyde and formaldehyde and benzyl aniline. In Patent 1,587,283 dated June 1, 1926 there is suggested the use of condensation products made from furfural or benzaldehyde and beta naphthylamine, cyclohexanone, meta toluylenediamine, paratoluidine, benzidine, meta phenylenediamine, xylidene, mesityl oxide or cyclohexane-carboxylic acid. In some cases the patentees suggest using a sensitizing agent such as a halogen or halide to increase the effect of light upon the artificial plastic coating. This, however, is unnecessary in most cases.

At the exposition of chemical industries recently held at New York some of these resins were exhibited. Their sponsors showed some excellent etched printing plates made by coating zinc and aluminum plates with these resins, exposing under a negative and then printing by light, after which the resin not struck by light was removed by a solvent and the plate etched. Decorated metallic buckles were also shown made by using these resins.

Pyroxylin as an Imitative Material

How inventors have exercised their ingenuity in adapting the versatile pyroxylin plastics to fabricate products rivalling nature in beauty

By Joseph Rossman

THIS article is a continuation from page 268 of the May issue and takes up now the preparation of artificial mosaic.

Manufacture of imitation mosaic and mother of pearl forms the main object of the processes described in the present continuation of this complete review of all the American patents on the development of the pyroxylin plastics as materials to simulate natural products, many of these methods are also suitable for use with the less inflammable cellulose ester products now coming into practical use.

The pyroxylin imitation mosaic is made in the following manner in patent 602,159 April 12, 1898. The pyroxylin compound is first formed into a number of small masses, which have small cross-sectional areas, preferably in the form of short sticks A, Fig. 1.* There may, however, be used other forms than sticks, such for instance, as small irregularly shaped pieces which result from the breaking up of a sheet or slab of pyroxylin compound or scraps left from the manufacture of other articles. A coating B of a dyeing substance, perferably a liquid containing a solvent of the pyroxylin compound, is applied to the surfaces of such pieces, and they are then placed in a box or chase and welded into a solid mass or block by the application of heat and pressure, such as is used in molding pyroxylin compounds. The coating may be applied in any suitable manner, and a good method is to put the pieces of pyroxylin compound in a wire basket and immerse them in the dye; but they may be dyed in any other way. The solidified mass is then cut into sheets the surfaces of which present an appearance similar to that of a mosaic.

The surfaces of two sheets which are cut from the same block will present a pleasing variety in appearance, owing to the fact that the coated pieces, which may have been alike before coating, becomes changed in form during the welding process. If the coated pieces of pyroxylin material in the soldified mass were originally in the form of short sticks, a good effect in the appearance of the sheets will be secured by cutting the block at varying angles to the length of the sticks composing the block.

The pieces of pyroxylin compound which are to be dyed may all be of the same color or of various colors or of different shades of the same color. If the solidified mass is to contain pieces of various colors, pieces of differing colors or shades of color may be assembled either before or after coating and before solidification.

Although it is preferred to use heat in conjunction with pressure in forming the welded block, yet if the dyed surfaces are sufficiently softened by the dyeing substance the heat may be omitted. Preferably, also, the color of the dye is one which will offer a contrast to the colors or shades of the pieces of pyroxylin material to be coated and thereafter to be solidified to form the mass or block. The dyeing substance appears in the sheets cut from the mass in the form of lines, imitating the cement used in mosaic-work.

Another Process:—

Multicolored Mosaic Effects

In carrying out the process of patent 619,037 take pyroxylin compound of suitable colors, solid colors being preferred, and reduce the compounds to fragments or pieces of irregular size and shape. The pieces thus formed are then placed in a sieve or other similar vessel and dipped in a dye dissolved in a solution of pyroxylin, ethyl alcohol being preferred. The same dye may be used for all or a different coloring matter for the fragments or pieces of each color of the compound may be used. The pieces thus prepared are then placed at once in the press and are pressed into cakes without being formed into crude sheets, as is usual in forming ordinary cakes of pyralin. The formed cakes are cut into sheets of the finished product. The action of the solvent holding the dye in solution places the pieces dipped in it in the very best condition for being united by the action of the press into a homogeneous mass. The cut sheet

*See p. 321 opposite, cut 8.

will thus have equal strength at every point, there being no tendency to break or separate along the lines of color demarcation.

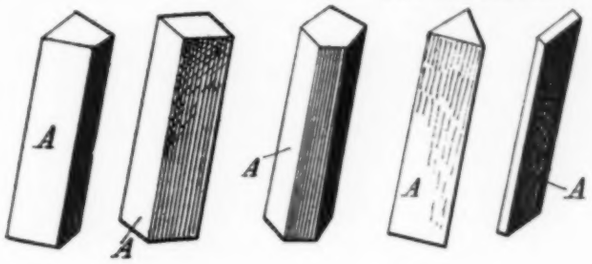


Fig. 1.

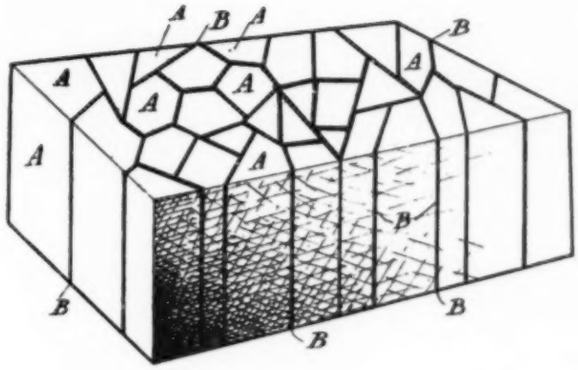


Fig. 2.

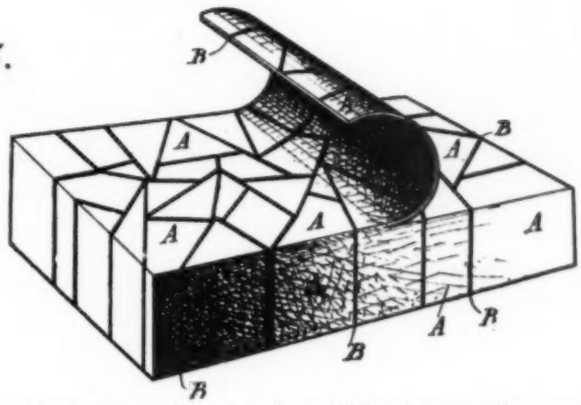


Fig. 3.

Cut 8—Fig. 1 is a view in perspective of rods or sticks of pyroxylin compound which are to be coated with a dye. Fig. 2 is a perspective view of a block or slab made by solidifying a number of the coated rods or sticks, and Fig. 3 shows the slab with a sheet partly planed therefrom.

The pieces of pyroxylin compound are colored, and their size is regulated with due regard to the special form of mosaic to be imitated, and a great variety of effects of great beauty may easily be obtained by slight variations in color, in the tints of the dyes, and in the size and form of the pieces of pyroxylin compounds.

In the drawings, the reference-numeral 1 indicates the finished product, and 2 denotes the component pieces of variously colored compounds of pyroxylin separated from each other by colored lines of demarcation 3.

Imitation Mother-of-Pearl

The irridescence or decomposition of light produced by mother-of-pearl, is caused by minute striations or substantially parallel lines or ridges which naturally exist on the surface, and a similar decomposition of light is produced by an artificially prepared optical surface, sometimes called a grating, which is made by engraving numerous fine parallel lines upon upon a suitable surface. Such lines have to be carefully made, and the optical gratings which have been heretofore used for producing this phenomenon of dispersion or decomposition of light have been very expensive, it being necessary to rule or engrave each surface with great care by special appliances.

The invention of patent 467,661 dated Jan. 26, 1892 is based on the discovery that an engraved grating can be employed as a die or form, from which surfaces having the same optical effect can be produced directly at a very moderate expense and without injury to the original form, which may thus be used to produce an indefinite number of articles having the desired iridescent surface.

The specific manner of obtaining the required surface from the engraved die depends largely upon the nature of the article to which the surface is to be applied. When the article is composed of plastic material or material that is plastic in some stages of its manufacture, as for example, celluloid, it may be caused to receive the striated light dispersing surface by being pressed against the surface of the die, or such striations may be produced upon a metallic surface by stamping the metal with the die, so as to impress the grooves and ridges in the surface of the piece of metal that is stamped.

In producing gratings in accordance with invention an optical grating a is produced in the

Fig 1.

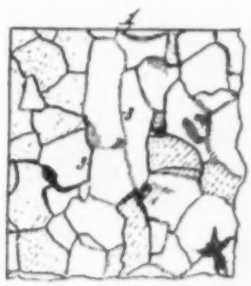
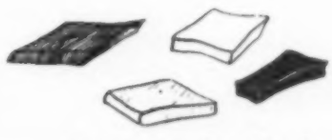


Fig 2.



Cut 9—Another Mosaic

usual manner by having its surface ruled or engraved with fine parallel lines sufficiently closely ruled to produce the desired color decomposition of light. In order to produce a similar light dispersing surface b (see Fig. 2) on any piece of material or article c that it is desired to have iridescent, the article c is pressed firmly against the striated surface of the grating a, or the grating is stamped or pressed against the article c so

Fig 1.

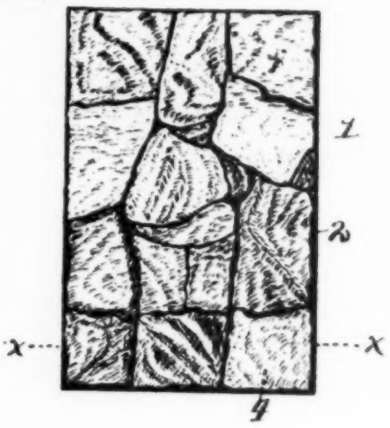
Fig 2.

Cut No. 10, showing how interference colors are obtained by impressing a fine grating on the surface of the plastic object.

that the surface of the latter is provided with ridges and grooves or lines which are counterpart of those on the grating a, and consequently have the same effect in decomposing the light that falls upon the surface b, when the article is removed from the die, or, in other words, in giving the article c a striated or iridescent surface. When the article c is of soft metal, it can be caused to receive the iridescent surface by direct pressure of the surface of the die, and when the article is of plastic material, such for example, as celluloid, the striations may be impressed in its surface from the striated surface of the die a when the material is in plastic condition, or if the article c has been previously hardened, it may generally be made sufficiently plastic to receive the striations from the surface of the die by having the die somewhat warm when the material is pressed against it. In some cases striated surface may be transferred directly to the surface of a transparent material, in which case the striations will disperse the light transmitted through the article, causing the dispersion of the transmitted light.

The Use of Mica For Imitation Mother-of-Pearl

In carrying out the process of patent 494,255 dated March 28, 1893 a sheet of celluloid, mica, isinglass, or other suitable transparent flexible material is cut in any suitable design. Upon one side of this a coat of heavy transparent varnish is applied which is covered with a design by the aid of pigment scraps or thin sheets of mother of pearl, or any other suitable and ornamental material. The whole is then covered with gold or silver leaf and allowed to dry perfectly in this state. When the sheet is entirely dry a sheet of tin foil is prepared and covered on one side a suitable varnish. The varnished side of the foil is laid upon the ornamented side of the sheet and the parts are pressed firmly and evenly together, making a smooth backing for the article. Next, having trimmed the tin foil away, wherever it is necessary to conform with the design of the article, the sheet is placed preferably between two pieces of flannel and subjected to considerable pressure. When this is relieved and the article is perfectly dry, it presents a complete article perfectly resembling in appearance the mother of pearl, or improved upon it by the introduction of the gold and pigment into the design and which is somewhat flexible, not liable to break by fall, and is in many respects more suitable for use in the arts than is the original. Besides this it may be made in any desirable size and is not confined, as is the mother of pearl, to a particular shape. It is light and durable and may be used in many of the arts, such for instance, as decorating boxes, or the like, for decorating ceilings, walls, mantel pieces and furniture, and in infinite variety of ways.



Cut 11—Making imitation mother-of-pearl.

Referring to the figures on the drawings, 1 indicates the pieces of manufactured mother of pearl. 2 indicates the outside sheet of celluloid, or the like, or what may be called the face of the article. 3 indicates a sheet of varnish spread upon the face of the transparent sheet, and 4 indicates the ornamental material which is laid upon the varnish, as above described. 5 indicates a sheet of gold leaf and 6 a coat of varnish. 7 indicates the outside cover of tinfoil secured to the gold leaf by means of the varnish described.

The Use of Bismuth Salts

The method of imparting an irridescent or mother of pearl appearance to celluloid in patent 1,372,088 Mar. 22, 1921 consists in rubbing the surface of the celluloid with bichlorid or trichlorid of bismuth, and thereafter passing the article through a water bath having liquid celluloid floating thereon.

See July for continuation of this story.

The Chemistry and Technology of Synthetic Plastics---A Romance

By Gustave P. Darwin

In the ordinary course of the development of a new chemical product, the usual order is the analysis of the subject matter, followed by its synthesis. This has been a basic foundation of chemistry for quite a long time. In the case of Insulin, the analysis and isolation of the product took approximately five years, whereas the synthesis to the place where it would be made available commercially, to the many people suffering from diabetes, took less than two years. In the case of phenol plastics, the very nature of these materials will not allow an analysis, because the polymerization of phenol and formaldehyde does not always stop at the same place. Even the scientists who did the original work of synthesizing these materials, can not agree upon the structural formula. This makes the accomplishment of manufacturing these materials all the more remarkable. Yet they are manufactured and used to the extent of millions of pounds per year. In addition to the accomplishment of their manufacture, is the very close uniformity of the products in their properties of plasticity and cure.

The primary use of phenol plastics or resinoids is in the form of what is known as molding compound. This is the basic condensation product mixed with adequate fillers. This has found a wide use in many places as a substitute for metals where the metal is subject to severe corrosion. The molded phenol plastic part being impervious to acids or alkalies, will stand up and fulfill the mission of the engineer. Many possibilities of the phenolic plastic field are very much unexplored at present, not because of the failure of these plastics but because of the absence of the necessary machines to fabricate the larger sized pieces required in industry.

As a substitute for wood and hard rubber, phenol plastics have been found to have many advantages, due to their strength, uniformity and rapidity in production, the permanency of the finished piece, appearance, etc.

From Novelties To Industrial Necessities

It is not so many years ago that phenol plastics were used primarily for novelties and inconspicuous small parts on new devices, and could almost be classed as a curiosity with little or no utilitarian value. At the present time, this situation is widely reversed and the largest part of the production of these materials is used for parts that that vitally influence industry.

A striking application of phenol plastics, is its use in handling Hydrofluoric acid. This acid which could only be handled in lead containers and apparatus, can now be safely handled in transparent phenol plastics. It has also been found that phenol plastics are very desirable substitutes for some of the metal apparatus previously used, particularly in the various pieces used in chemical laboratories; and it is within the bounds of the imagination to see the laboratories of the near future being built where phenol plastics would be used for benches, tables, sinks, shelves, fume hoods, etc. It also seems as though they have great possibilities of replacing some of the glass or stone table tops which at the present time, are very brittle and non-resistant to heat.

Modern industry in its progress, found that old standards of control were no where near close enough for the present day attention paid to the recovery of by-products. What a few years ago, would have been work considered accurate enough for research, today must be the ordinary results of the control chemist. Phenol plastics have helped in the building of instruments for this work and with the accurate results obtained an investigation of the discrepancy of less than 100% analysis has led to discoveries that this small part in some sludges and waste liquors contain material which could profitably be recovered.

It has also played a prominent part in the design and building of equipment used in the determination of H Ion concentration.

As a substitute for die casting, they have liberated many of the high priced alloy metals, thereby easing the market on these metals and leaving them for applications where no other metal would do. This has been a great relief in the case of some of these metals as the total world production is very limited, and the constant new uses of die casting would sooner or later force a substitution of some other metal or retard progress until a new alloy was discovered.

In the Oil-less Bearing

Phenol plastics have played an important part in the manufacture of one article which has always been much sought after, namely an oil-less bearing. When phenol plastics are incorporated with graphite, it is found that this material in some instances can be used very successfully, and in the handling of food stuffs, prevents contamination with oil. Its strength is

(Continued on page 340)

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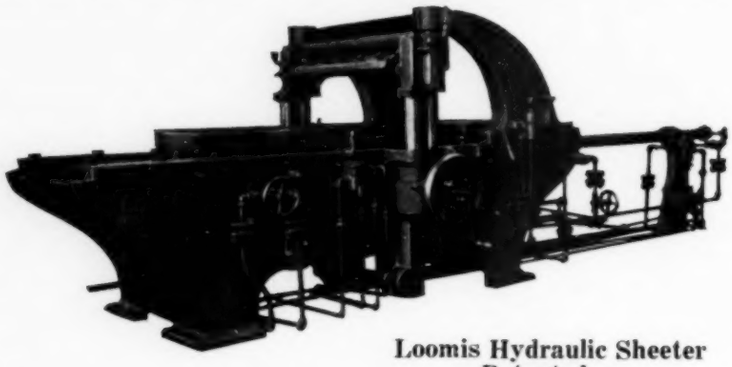

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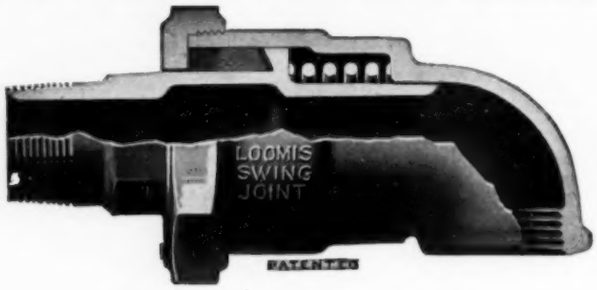

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The World's Recent Progress in Synthetic Resins

A complete and condensed account of patents from the most important industrial countries

By Dr. Aladin

The patents that are listed here are all of recent origin and disclose the progress realized throughout the civilized world in this field. The dates, except in case of U. S. patents, are those of application. There will be a total of over 450 patents in this review. Publication began in April 1929.

2. Preparation of Phenol-formaldehyde Resins using Acid Condensing Agents

(Continued from May Issue)

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	
31	Aus. Pat. 105,352	M. Melamid	Manufacture of resinous condensation products.	Cf. U. S. P. 1,648,858 (No. 8)
32	Aus. Pat. 106.018 6-27-1921	E. Glaser	Production of condensation products from waste water of preparation of phenolic resins	The products are treated with acids or acid salts at ordinary temperature or at least not above 60°C. Soluble resins (Novolaks) are obtained These are then treated with formaldehyde in presence of alkaline condensing agents, yielding heat-hardenable resins (Resites)
33	Aus. Pat. 106,329	C. Kulas and J. Scheiber	Resinous condensation products from phenols and aldehydes	Cf. German P. 436,779 (No. 18).
34	Aus. Pat. 108,108	C. Kulas and J. Scheiber	Preparation of condensation products from phenols and aldehydes	Cf. German P. 436,779 (No. 18).
35	Swed. Pat. 57,494	R. Tarasoff	Phenol-aldehyde condensation products	Sulfonated rosin oil is used as a catalyst.
36	Swed. Pat. 58,935	G. Petroff	Phenol-aldehyde condensation products	Condensed by aid of acids in presence of acetate acid esters of glycerol, or of cellulose acetate etc.
37	Swiss Pat. 116,160 3-7-1925	C. Kulas and J. Scheiber	Resinous condensation products from phenols and aldehydes	Cf. German P. 436,779 (No. 18).
38	Swiss Pat. 122,993	Bakelite Corp.	Preparation of resinous condensation products yielding elastic coatings	Cf. French P. 615,713 (No. 29).
39	Swiss Pat. 123,274			

2-b. Preparation of Phenol-formaldehyde Resins with Alkaline Catalysts

40	U. S. P. 1,607,293	C. Mouren and Dufraisse	Preparation of insoluble plastics from phenols and an aldehyde	Alkaline condensation of phenols with acrolein or the resinous bodies derived from the latter by treatment with alkalies.
41	U. S. P. 1,614,025	A. S. Williams and J. T. Collins	Plastic masses from sulfate process cellulose waste liquors	The precipitate obtained when acidifying sulfate process spent cellulose waste liquors is dissolved in alkalies, and aldehyde (formaldehyde) and a phenol (cresol) are added and the mixture is heated to 50°C. After the reaction is completed the mass is acidified and the thus precipitated substance is washed and then pressed under pressure and heat.

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	
42	U. S. P. 1,614,171	A. Amann and E. Fonrobert (Chemische Fabrik Dr. Kurt Albert Ges. m. b. H.)	Preparation of fluid or crystalline condensates from mono or dicyclic phenols with aliphatic aldehydes	Phenol dissolved in an alkaline solution is introduced at room temperature (or cooler) into an excess (at least 1½ mols) of formaldehyde or acetaldehyde, there being an excess of the aldehyde at the end of the reaction. Di-and polyalcohols are obtained which contain the aldehyde in particularly reactive form. On heating infusible products can be obtained.
43	U. S. P. 1,614,172	A. Amann and E. Fonrobert (Chem. Fabrik Dr. Kurt Albert Ges. m. b. H.)	Resinous condensation products from phenols, ketones and aldehydes	Condensation products from phenols and acetone or aliphatic-aromatic ketones (such as acetophenone) are, at a temperature not in excess of 60°C. treated with an alkaline solution of aldehydes. The reaction products are recovered from the mixture by acidification. They are plastic masses to which the usual fillers may be added.
44 45	U. S. P. 1,624,082 U. S. P. 1,624,638	F. von Briesen (C. O. Terwilliger Assignor)	Preparation of resinous condensation products from tar oils, ketones and formaldehyde	Phenolic coal tar oils or the phenols isolated therefrom are condensed with aldehydes and ketones by aid of alkaline condensing agents. Soluble resins result. These are mixed with wood flour, saw-dust or the like and heated and hardened under pressure at 150°C.
46	U. S. P. 1,630,365	H. Weber (Westinghouse Elec. & Mfg. Co.)	Manufacture of condensation products	Cellulose (or starch or a sugar) are condensed with phenol by using sodium carbonate or ammonia as a condensing agent, although zincates, stannates, stannites, antimonates, aluminates or titanates may be used instead. The products are then condensed with formaldehyde. When hardened under pressure insulating substances are obtained.
47	U. S. P. 1,658,281	Aug. Nowack A. G. (R. Beutner, Assignor)	Preparation of resins	Phenolic tar oils and aldehydes are condensed in presence of a solvent (petroleum or the like), using alkaline catalysts. The desired product is found in the lower layer.
48	U. S. P. 1,669,674	C. Romieux (American Cyanide Co.)	Preparation of phenolic resins	Phenols from wood tar, coal tar, or from bituminous shales are condensed with an aldehyde (such as formaldehyde, acetaldehyde, furfural) by adding small amounts of alkalies. The products are hardenable at higher temperatures.
49	U. S. P. 1,681,155	J. S. Melanoff (Kemikal, Inc.)	Plastic masses from peat	A soltuion of peat in an alkali is mixed with phenol and an aldehyde and the resulting product is heated further until it becomes infusible and insoluble.
50	U. S. P. 1,683,701	F. Seibach (Bakelite Ges.)	Preparation of artificial resins	Equimolecular amounts of phenol (or cresol) and formaldehyde are condensed with more than 20% of an aromatic amine (aniline, toluidine, anthranilic acid,1-aminonaphthalene-5-sulfonic acid.

Serial No.	Patent Number and Date	Title of Invention	Inventor or Assignee	
51	U. S. P. 1,684,142		G. Petrov and P. Schestakov	Preparation of phenol-formaldehyde condensation products	Phenol or cresol is condensed with 40% formalin with the use of metallic powders (10% lead or 5% zinc as calculated on the amount of phenol.) The products form the base for lacquers. They may however be hardened by heating with aromatic sulfonic acids.
52	Can. Pat. 258,977		C. O. Terwilliger	Preparation of resinous products from tar oils or phenolic ketones and formaldehyde	Cf. U. S. P. 1,624,082 (No. 44) and 1,624,638 (No. 45).
53	Can. Pat. 258,978				
54	Can. Pat. 262,135		A. Regal	Preparation of resinous condensation products from phenol and formaldehyde	Condensation products derived from dialkyl anilines and formaldehyde are used as Catalysts in the condensation for phenol and formaldehyde hot. The resulting insoluble products are very hard, elastic and not brittle.
55	Ger. Pat. 439,962 3-26-1920 (Frdl. No. XV 1219) (Addition to 364,040)		I. G. Farbenindustrie A. G.	Preparation of resinous condensation products from aryl-oxy-acetic acids and aldehydes	Not completely condensed products prepared from phenols and aldehydes are treated in alkaline solution with halogenated fatty acids. Alkali-soluble resins result.
56	Ger. Pat. 442,361 5-20-1925 (Frdl XV 1218)		A. Regal	Preparation of resinous condensation products from phenols and aldehyde by use of a catalyst	Arylhydrazine is an active catalyst. Formaldehyde is heated with phenyl hydrazine, trioxmethylene is added, then phenol and the mixture is heated until separate layers form. The fusible and soluble resol can be hardened to form a dark red resite.
57	Ger. Pat. 449,276 1-14-1920 (Frdl XV 1220) (Addition to 386,733)		I. G. Farbenindustrie A. G.	Preparation of derivatives of resinous condensation products from phenols and aldehydes	Resinous phenol-aldehyde condensation products are treated with 1 mol. of an halogenated fatty acid in alkaline solution.
58	Ger. Pat. 458,105 5-11-1924		W. Tod Jr. & Co. Ltd. (1923)	Preparation of artificial masses from phenol-aldehyde condensation products and a cellulosic filler	Phenols and formaldehyde are condensed in presence of calcium hypochlorite and of the oxycellulose resulting as a by-product from the manufacture of paper from esparto grass.
59	Brit. Pat. 255,516 4-17-1925		Silimanite Insulator Co. Ltd. and A. H. Brown	Preparation of fluid and solid condensation products from phenols, aldehydes and or ketones.	Without heating, phenol and aldehydes or ketones are treated with catalysts such as ammonia, and a small amount (3%) of castor oil is also added (linseed oil may be used). The mixture is stirred until the product separates. It is fluid but may be further polymerized by heating.
60	Brit. Pat. 259,046 4-9-1925		E. E. Walker	Preparation of phenol-aldehyde resins	Phenol is condensed with more than 1 molecule of formaldehyde by means of alkaline catalysts. The mixture is then acidified, washed with water and heated in vacuo until all volatile matter is removed. The product is hardened at 130°C.
61	Brit. Pat. 261,472 8-19-1925		Chem. Fabrik Dr. Kurt Albert G. m. b. H.	Preparation of fluid or crystalline condensation products from mono or dicyclic phenols and aliphatic aldehydes	Cf. U. S. P. 1,614,171 (No. 42).

For further patents in this review see the July issue of Plastics.

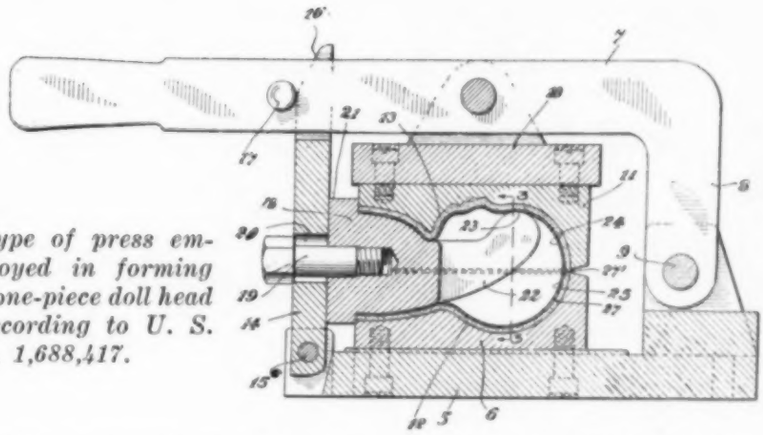
Molding Dolls Not an Easy Matter

Particular attention is given to making flawless heads. Ordinary, not hydraulic, presses are employed and the plastic is usually made from wood pulp. How Leo J. Grubman proposes to solve the problem

THOUGH an ancient industry, there is still room for considerable improvement in the making of dolls, as is shown by the fact that inventors are still engaged in perfecting methods to provide the universally favored toy—dolls.

Doll Heads

In the manufacture of doll heads from wood pulp, papier mache or other composition material, it has heretofore been customary in the art to mold the head in separate front and rear sections by means of separate molds. The two head sections were then joined edge to edge by means of cement, glue or other suitable adhesive. Owing to the fact that these meeting edges of the two head sections are irregular, it was not an uncommon occurrence that although there was apparently no gap or space left between the two head sections, after the glue had dried and the surplus was removed by sandpaper or otherwise, crevices would appear at intervals between the edges of the two head sections. It was then necessary to fill these crevices and again remove the surplus cement or adhesive material. Thereafter, the surfaces of the head were rubbed down with sandpaper or emery cloth to remove hard projecting particles of the composition material and render the surfaces entirely smooth and even, before applying the final or finishing solution to the surfaces of the head. Such rubbing or abrasive action unavoidably obliterated the finer lines or contours, delineating the detail features of the face. Therefore, after the head was finally immersed or otherwise covered by the coating solution which, after hardening, was polished and painted, the completed head failed to bear the desired natural or life-like appearance. I propose by means of my present invention, not only to materially improve the naturalness or realistic appearance of the doll head, but also to eliminate many of the operations required in carrying out such prior art method, thereby reducing manual labor and expediting quantity productions of such doll heads. Leo J. Grubman, of Belle Harbor, New York, according to his U. S. P. 1,688,417; Oct. 23, 1928, produces, in a single operation, in a continuous layer of impression receiving material both the front and rear parts of the head. Thus, when the head is removed from the mold, it is completely closed except for the longitudinal opening through the neck leading to the interior of the head. It is true that one-piece doll heads have heretofore been produced, but in such cases, in order to mount or arrange an eye setting within the head it was necessary to cut an opening in the top of the head and thereafter to close the opening by re-uniting the top section with the body of the head.



Type of press employed in forming a one-piece doll head according to U. S. P. 1,688,417.

In Fig. 1 there is illustrated one embodiment of molding apparatus consisting essentially of a suitable base 5 upon which a stationary mold section 6 is suitably fixed. Upon one end of this base 5 the angular end 8 of a lever 7 is pivotally mounted as at 9. A bracket 10 is fixed to this lever and carries the movable section 11 of the mold. The complementary cavities 12 and 13 respectively, of the two mold sections 6 and 11 have their surfaces very accurately machined and finished. The surface of the mold cavity 12 determines the contours of the opposite sides and rear portion of the doll head while the surface of the mold cavity 13 determines the contours of the forward side portions and the front or facial features of the doll head.

Mechanical Details of Mold

Upon the other end of the base 5 with respect to the pivot 9 of the lever 7, an arm 14 is pivotally supported at its lower end as at 15, the other end of said arm being bifurcated to receive the lever 7 and having the inclined cam surfaces 16. With

these cam surfaces the ends of a transverse pin 17 fixed in the lever 7 are adapted to coact. To one side of the arm 14 a core supporting member 18 is detachably and adjustably secured by means of the bolt 19 engaged through the slot or opening 20 in said arm. This support has a cylindrical tapering or conically formed body in which the bolt 19 is threaded, said body at its base having an annular flange 21. A longitudinally extending upwardly curved arm 22 projects from the smaller end of said conical body and at its outer end has a rounded or convex edge 23.

How It Is Done

In the use of this molding apparatus in the production of one form of the doll head, a suitable core is arranged upon the support 18 roughly conforming in longitudinal and transverse configuration to the outlines of a doll head. As shown in Fig. 1 this core may consist of front and rear sections 24 and 25 produced by die stamping from sheet metal or other suitable sheet material. In forming these core sections, the outlines of the ears are not produced so that the meeting edges of the two sections when placed together extend in a straight longitudinal line bisecting the core. These meeting edges of the core sections are provided with narrow outwardly projecting flanges 26 and these flanges are united or secured to each other preferably by electrical welding. After the core has thus been formed, it is inserted over the support until said core at its open end abuts against the flange 21 while the curved edge 23 of the arm 22 bears against the inner side of the core section 24 in proximity to the part thereof corresponding to the forehead. The neck portion of the sheet core fits more or less snugly upon the conical surface of the body of the support 18. The arm 14 is then swung upon its pivot 15 until the section 26 of the core is positioned in the cavity 12 of the stationary mold section 6. A thin layer of plastic or semi-plastic composition material indicated at 27 is first arranged over the surfaces of the mold cavity 12 and after the core is positioned thereon, a similar layer of such composition material is disposed upon the surface of the core section 24. By means of the lever 7, the movable section 11 in the mold is then lowered into position in superposed relation to the base or stationary section 6 so that the core section 24 and the plastic material thereon is received within the cavity 13 of the movable mold section. In this operation, the pin 17 coacting with the cam surfaces 16 forces the arm 14 towards the mold and tightly engages the flange 21 thereon against the ends of the two mold sections 6 and 11, thus accurately positioning the core relative to the surfaces of the mold cavities. As the upper mold section 11 bears upon the impression receiving composition material, impressions are formed in such material corresponding exactly with the contours of the surfaces of the mold cavities 12 and 13. Any excess of such material will be exuded from beneath the opposed edges of the two mold sections at 27', at which point a slight projecting fin of the material will form extending longitudinally from the exterior surface of the molded head. It will thus be seen that the sheet metal core becomes a part of the doll head and constitutes an internal lining therefor, the said core being inseparably interlocked by means of the laterally projecting flanges 26 on said core, with the outer coating of composition material in which the physical features of the head are impressed. The hollow metallic core or lining greatly strengthens or reinforces the head structure and enables the use of a comparatively thin layer of composition material of better quality and more uniform consistency than that heretofore employed. After the head is removed from the mold and permitted to harden and set it will

(*Continued on page 341*)

Use of Non-Volatile Solvents for Use in Molding Cellulose Ether Plastics Held Not Patentable

BY a decision rendered by the Court of Appeals of the District of Columbia on Dec. 3, 1928, and published in the Official Gazette of the United States Patent Office March 12, 1929, it is held that in view of Lilienfeld's patents 1,188,376 and 1,217,027 it is no longer possible to patent the molding of cellulose **ether**plastics that contain relatively non-volatile solvents or plasticizers.

The decision was rendered on an appeal to the court from a decision of the Board of Patent appeals in the case of an application of Dr. Dreyfus, holding that claims that contain clauses to the effect that an article is formed from cellulose ethers by melting the same in the absence of volatile liquids, and article claims for products formed from cellulose ethers containing neither volatile solvent nor volatile diluent are not patentable, in view of the Lilienfeld patents. The latter disclose fully the preparation of fusible plastic compositions from cellulose ethers such as ethyl cellulose and other alkyl ethers of cellulose.

In the language of the Court Lilienfeld "discloses a broad conception of the use of nonvolatile solvents mixed with ethers to produce plastic compounds which can be molded while in a melted condition", stating further that "we think, therefore, without examining the other references, that the appellant (Dreyfus) is fully anticipated by the Lilienfeld patents."

As a corollary to this decision it should however not be forgotten that the Lilienfeld patents still have about four years to run before they become open to the public to use.

Machinery and Apparatus Dominate Chemical Exposition

Manufacturers of chemical products however appear to be missing an opportunity

By Carl Marx
Editor of Plastics

DURING the week of May 6th, the Grand Central Palace at New York was a veritable bee-hive of activity. Chemists and the general public interested in chemical industry gathered in huge numbers to examine the many interesting exhibits set up for their information and entertainment.

The exposition just closed was undoubtedly the most interesting and best attended since the enthusiastic and important expositions held during and just after the war when interest in chemistry was at its height.

Gradual Transition

Considerable changes have however come over the exposition. Whilst during the war and for a short time thereafter it was a proud expose of the achievements of America's chemists, it has since developed into practically an apparatus and equipment show.

Whilst most of the manufacturers of machinery and appurtenances for the production of chemical products were well represented, the actual showing of *chemical products* was somewhat disapointing.

Even the American Chemical Society contented itself with a very entertaining, but hardly chemical, electrical control apparatus known as the Televox. In past years they had a *Court of Chemical Achievement*—but not so this time.

It is the belief of the writer, unquestionably shared by many others, that the producers of chemical products are missing an excellent opportunity of acquainting the public with the merits and value of their products. Formerly every dyestuff producer had a large and interesting exhibit. Large chemical manufacturers such as the Grasselli Co., Allied Chemical Co., National Aniline Co., General Chemical Co., Copper Companies and Steel Companies maintained booths and displayed their products—but they were not represented this year.

As to the field of more direct interest to us as exponents of Plastics, the manufacturers of resins and cellulose products appeared to realize the full value of the exposition and all of the larger ones had splendid booths and exhibits. An account of the showing made by the Bakelite Corp., General Plastics, Inc., the casein solids manufacturers, etc., is given in our present *Molded Products Section.*

However, the producers of the so essential raw materials were mostly conspicuous by their absence. A notable exception was the exhibit of the Miner Laboratories, who displayed furfural and its derivatives and resins; the Selden Co., who exhibited phthlalic anhydride, resins derived therefrom and micanite products; and the firm of Kuttroff, Pickhardt & Co., who showed some new German glass-clear synthetic resin known as *Mowilith*, said to be particularly applicable for lacquers.

No manufacturers of phenol, formaldehyde, acids, catalysts, solvents, etc. exhibited their wares! A single exception was the Becker-Moore Co., who made a good showing of woodflour and its uses.

Suggestions

It is confidently believed that the next Chemical Exposition will have more exhibits from the producers of chemical products and that more of the manufacturers of plastics will be represented. For an account of the doings of our own magazine and for impressions gathered by those more immediately interested in the final molded products our readers are referred to the Molded Products Section.

The general interest shown in the exposition, as witnessed by the large attendance, makes it an ideal place to further the cause of American Chemical Industry.

We must maintain our leadership in the production of chemical products, won as the result of the exigencies of the war—and maintain our independence of foreign sources of supply.

Even though some exhibitors fail to show a profit as a direct result of their booths at the show, they should consider the effect on the industry in general.

Technical Abstracts Section

A Concise Review of Patents and Literature

As already mentioned in our pages some months ago, we are now bringing our readers a more complete service in these pages of abstracts by including not only the American patents, but those of the rest of the civilized world as well.

Inasmuch as patents issue more rapidly in other countries than our own, the great strides being made in the plastics industries will be better realized and our readers kept more nearly up-to-date as to information.

Dicyandiamide-aldehyde Condensation Products. British Patent No. 287,-177, March 18, 1927, K. Ripper.

Dicyandiamide is condensed with formaldehyde with or without the presence of other substances capable of combining with formaldehyde to give resins, to form hydrophobe products which are converted by cold water into fine powders, which can be molded and pressed. Various details and examples are given.

Molding Ebonite (Hard rubber). British Patent No. 286,915, Nov. 2, 1926, A. Fraser, & Rissik Fraser & Co.

In subjecting ebonite dust to pressure and heat, molds are used, the inner surfaces of which are composed of materials such as tin, brass, duralumin or other aluminum alloy, rustless steel containing no nickel or an alloy such as described in British Patent 250,721 to which the ebonite dust does not stick and with which it does not react.

Insulating Material from Casein, glue or starch and bituminous substances. British Patent 291,858; Aug. 16, 1927. D. Anderson & Son, Ltd. and R. O. Child.

Tarry substances, rosin and the like are mixed with casein, glue or starch by use of either heat or and solvents and eventually molded into insulating material. The coagulation of the casein by the use of a sulfonated oil is mentioned.

Insulating Material from cellulose nitrate, plasticizers and fillers. French Patent 641,487; Sept. 23, 1927. Interessen-Gemeinschaft Farbenindustrie A. G.

Fibrous inorganic materials and minerals are mixed with a binder made from cellulose nitrate and a suitable plasticizer such as triphenylphosphate or the like. Resinoids may also be employed with the cellulose nitrate. The preferred materials used for fillers are a form of asbestos and mineral (slag) wool.

Electrical Insulation from sulfur, antimony trichloride, tar and paraffin. Russian Patent 4799; Mar. 31, 1928. I Slasikov.

Equal parts of sulfur and antimony trichloride are heated together to 400° C. and are then poured into cold water to yield a stable form of plastic sulfur which is then mixed with wood tar, coal tar and paraffin wax. The product forms a binder for molded insulation.

Aminoplastics from urea. French Patent 641,770; Oct. 3, 1927. Interessenfemeinschaft Farbenindustrie A. G.

Urea is heated with alcohols or ketons or their derivatives, with the addition of catalysts, preferably under pressure. To increase the hardness of the products formaldehyde may be used on them.

Aminoplastics from aldehydes and hydes. French Patent 641,420; Sept. 11, 1926.

Urea and formaldehyde are separately dissolved in organic solvents, preferable in the absence of water and the solutions are then mixed and heated, either with or without catalysts. As suitable solvents for the purpose are mentioned: ethylene chlorohydrin, glycol monoacetate or monoalkyl ethers of glycol.

Aminoplastics from aldehydes and urea and thiourea. British Patent 291,366; May 31, 1927. Kunstharzfabrik F. Pollak Gesellschaft.

A molding powder is made from condensation products of urea thiourea with formaldehyde, the powder being dried in vacuo to remove as much water from it as possible. Any excess of formaldehyde in the product is removed by treatment with ammonia. The powder possesses the property of swelling under heat and will then be united into **transparent molded products.**

Phenoplastics. Russian Patent 4838; March 31, 1928. G. S. Petroff.

To an intermediate condensation product of phenol and formaldehyde, made in the usual manner, there are added the products resulting from the treatment of halogen derivatives of ethane and of ethylene with acid or alkaline catalysts.

Hydrocellulose etc. as fillers in plastics. Russian Patent 3951; July 31, 1928. A. E. Porai-Koshitz and G. S. Petroff.

The waste material resulting from the acid distillation of furfural-yielding plant husks, seed-shells etc. are further treated with acids and then converted into a form in which they may be incorporated into plastics as fillers.

Casein plastic manufacture. French Patent 641,896: March 12, 1927. De Carsalade et Regimbeau.

In order to prevent the formation of airbubbles in plastics made from casein the plastification of the casein is carried out under vacuum.

Sulfur plastics. British Patent 291,-500; Feb. 28, 1927. F. N. Burt Co.

In order to render sulfur more penetrating when used in conjunction with a fibrous filler such as cellulose, pulp, and the like, and organic substance capable of rendering the sulfur more fluid is employed. Such substances, termed by the inventor as "introfiers" may consist of naphthalene or anthracene or their halogenation products, triphenyl phosphate, quinolene etc. etc. (Note: This was known to the editor of this journal since 1922 when he carried out numerous experiments along this line. The use of naphthalene to form a solid solution with sulfur and to lower the melting point of sulfur was a well known art 20 years ago.)

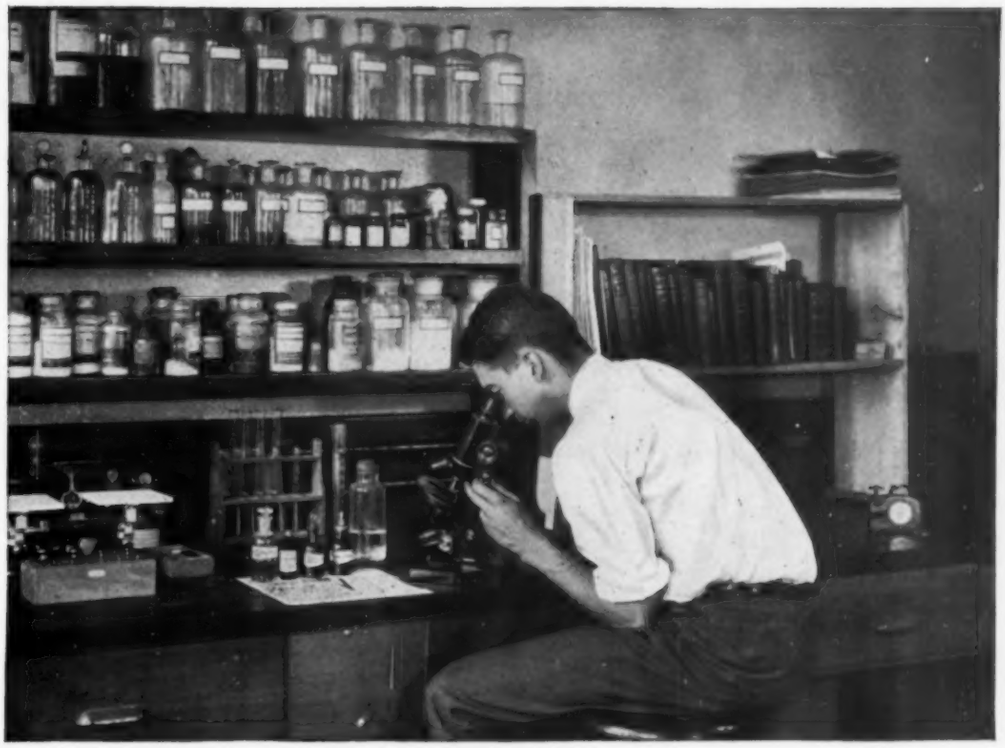
Molds for molding albumenoid plastics; use of chromium plating. German Patent 469,280; April 29, 1925. Muller & Mann.

In order to keep the molds bright and polished and to minimize the sticking of material thereto when molding plastics containing casein, gelatine etc. the molds are electroplated with chromium or with its alloys.

Molded Articles from Cellulose. French Patent 641,573; Sept. 20, 1927. C. Zarfel and W. D. Stroever.

A sort of papier-mache type of plastic may be prepared from waste products such as cellulose fibers, spent tank, bark of trees etc. that has been boiled for several hours under pressure with ¾% sodium hydroxide solution and then filtered and washed (much as in making paper from such products.) The fibrous material resulting from this treatment is then molded into commercial articles. To increase the hardness of the articles actual paper pulp may be added thereto.

(Continued on page 334)



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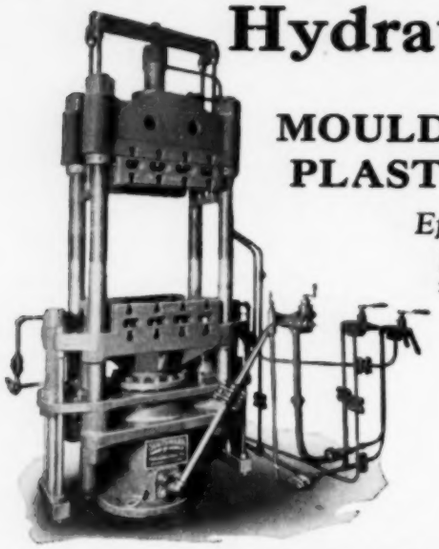

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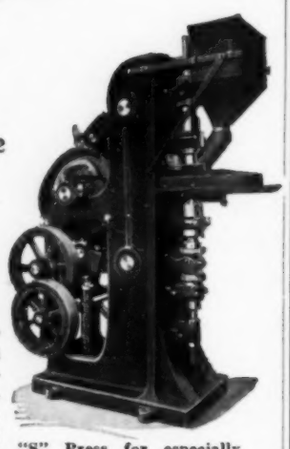

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Abstracts

(*Continued from page 332*)

Phenoplastics. French Patent No. 638,887, Dec. 27, 1920. G. Bia and J. de Bielize.

A dielectric nonbrittle plastic substance is made by condensing phenol with a large excess of formaldehyde. A catalyst such as magnesium oxide, sodium carbonate, or a mixture of sodium carbonate and sodium metaborate may be used, and a little paraffin is added to render the substance elastic.

Cellulose Ester Manufacture. British Patent No. 287,880, March 28, 1927, Clarke, et al.

Cellulose or a suitable cellulose conversion product or derivative is treated with an organic acid and the corresponding anhydride, preferably in the presence of a solvent for both the acid and anhydride such as halogen acetic acid. Processes are described, particularly suitable for the manufacture of mixed esters containing acyl groups derived from aliphatic acids containing 2, 3 or 4 carbon atoms, and also acyl groups derived from aliphatic acids containing more than 8 carbon atoms. The starting material may be undegraded cellulose, hydrocellulose, reverted cellulose and lower nitrates, acetates, formates or ethers. By use of the appropriate organic organic acid together with magnesium chlorate the following esters may be obtained: propionates, butyrates, isobutyrates, valeriates, isovaleriates, caporates, heptylates, caprylates, pelargonates, caprates, laurates, myristates, palmitates, stearates, crotonates, cyclohexane carboxylates, benzoates, o-methoxybenzoates, o-chlorobenzoates, acetylsalicylates; phenylacetates, hydrocinnamates, cinnamates and x mixed esters derived from stearic and acetic acids and from o-methoxybenzoic and acetic acids. Numerous details and examples are given.

Glycerol monoformal as Cellulose Ester Solvent. British Patent No. 286,789, Dec. 10, 1926, I. G. Farbenindustrie A.-G.

Cellulose Esters and ethers are dissolved in aqueous solutions of compounds of the acetal type of polyhydric alcohols, and other solvents, plastifying agents, dyes, etc. may be added. e. g. cellulose acetate is dissolved in a mixture of water 30 and glycerol monoformal 60 parts or water 20 and glycol formal 70 parts. The solutions may be used for making films, for printing or impregnating or as lacquers.

Cellulose Esters. French Patent No. 638,897, Dec. 28, 1926, H. Barthelemy.

Cellulose is pre-treated with warm AcOH vapors to soften the cellulose and then esterified with successive additions, in convenient quantities, of the esterifying agent.

Cellulose Esters. French Patent No. 638,902, Dec. 28, 1926, H. Barthelemy.

Cellulose is esterified by organic acid anhydrides, particularly Ac_2O, in

the presence of known catalysts such as sulphuric acid and a compound capable of liberating oxygen, such as peracids or peroxides. Examples are given in which $Na_2Cr_2O_7$ and potassium permanganate are used.

Cellulose Esters. French Patent No. 638,903, H. Barthelemy.

Describes a process of esterification in which the cellulose is previously treated with oxidizing agents such as peroxides or peroxide in an aqueous alkali solution. Carbonates, silicates o rsoaps may be added to avoid the formation of alkali cellulose.

Cellulose Esters. French Patent, No. 638,900, Dec. 28, 1926. H. Barthelemy.

Cellulose is acetylated in a rotating vessel which presents discontinuous surfaces of contact such as a cube or parallelepiped or cylinder turning about an axis inclined to the axis of symmetry.

Preparation of Cellulose Ethers. British Patent No. 288,143, March 31, 1927, I. G. Farbenindustrie, A.-G.

In working up compositions by heating, solvents are used which dissolve the cellulose ether used only when heated. On cooling, the solution gelatinizes, or the ether separates as flakes or grains; the hot solution can be purified by filtering. Solvents which may be used for the higher ethyl cellulose ethers comprise benzene, ligroin and aromatic substances such as hydrotoluene or hydronaphthalenes or their mixtures.

Phenoplastics from p-dichlorobenzene. British Patent No. 286,731, March 10, 1927, Schieferwerke Ausdauer A.-G.

A viscous condensation product is is made by heating to boiling a mixture of phenol p-dichlorobenzene and formaldehyde in the presence of a catalyst such as sodium chloride and ammonium chloride and hexamethylenetetramine. The product may be hardened by further heating at about 80° and may be used with fillers, etc. British Patent No. 286,732 specifies forming sheets and articles of insulating material by cold pressing under very high pressure condensation products similarly producted.

Aminoplastics... British Patent No. 287,095, March 14, 1927, I. G. Farbenindustrie, A.-G.

Examples are given of the condensation of acetylurea, diacetin and benzylamine; urea, butylene glycol and acetanilide; urea, methylcyclohexanol and toluenesulfonamide; and of urea, cyclohexanone, acetanilide and toluenesulfonamide. Oily products are obtained which on prolonged heating are transformed into resinous materials which may be used as softening agents for cellulose esters.

Decreasing the viscosity of cellulose esters. French Patent No. 636,272, June 20, 1927, Dreyfus.

To lower the viscosity of concentrated cellulose ester solutions, particularly cellulose acetate, they are treated with peroxide in the presence of iron or iron salts. Ferrous salts, especially ferrous acetate, are preferred, and they may be added during esterification while the peroxide is added after esterification.

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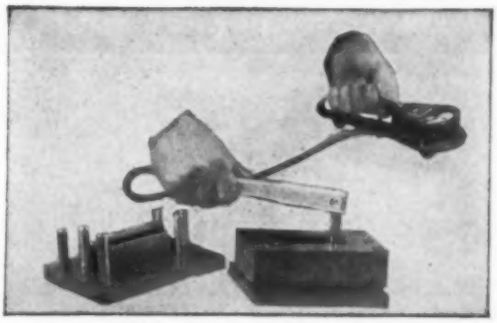

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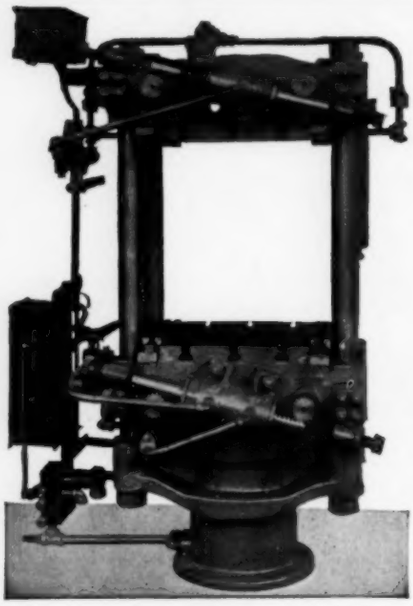

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Cellulose Butyrate and Propionate. British Patent No. 285,858, Feb. 23, 1927, I. G. Farbenindustrie, A.-G.

Esters of cellulose or of its conversion products with butyric, propionic and other higher alipratic acids are prepared by reacting on the cellulosic material with halongenated acetic acid anhydride and butyric acid or other acid corresponding to the ester to be formed in the presence of a catalyst such as monochloroacetic acid or sulphuric acid. The esters first formed may be modified by hydrolyzing.

Cellulose Acetate covered handles, etc. British Patent No. 286,006, Nov. 29, 1926, Smith.

Tennis racket handles, electric lamps or other articles to be decorated are overlaid with a yarn or fabric such as cellulose acetate which is then treated with a solvent such as ethylacetate, which, at least, partially dissolves the material applied and causes it to adhere to the surface. Various details and modifications are described.

Review of Vinyl Resins. American Paint Varnish Manufactures Association, Circular No. 337,637-55-1928.

The preparation and certain properties of the condensation resins of vinyl alcohol and chloride are reviewed with regard to their use in protective coatings. Many patents covering these resins are reprinted, showing the specific claims.

Resinoids in Coating Compositions; a review. American Paint Varnish Manufacturers Association, Circular No. 399,673-1928.

Recent synthetic resins containing phenol-formaldehyde and glyceryl phthalate are briefly referred to. The results of accelerated roof tests are given of seven varnishes made from tung oil—soy oil mixtures with two different x synthetic resins compared with like varnishes made with ester gum and with rosin. The synthetic resin varnishes gave better durability. Photomicrographs illustrate the various types of perishing shown by different varnishes. Patent references and specifications are given for many phenolic and phthalic type, condensation resins.

Clear cast resins. French Patent No. 638,084, July 21, 1927. Bakelite Corp.

Phthalic anhydride is caused to react on a polyhydric alcohol, at a temperature below 175°. The product is poured into molds and the heating continued at 90-125° till hardening takes place. A brilliant hard resin without inherent color is obtained.

Glyptal type soluble resins. French Patent No. 638,121, July 29, 1927, Bakelite Corp.

A resin suitable for varnishes, enamels, etc., is made by heating 100 parts of glycerol with 200 of phthalic anhydride till gelatinzation begins, then 100-200 parts of a solvent of high boiling point is added, such as diethyl oxalate or glycol diacetate, and the heating is continued till gelatinzation begins again.

Solubilizing Resinoids. French Patent No. 638,275, June 24, 1927, Compagnie Francaise Pour L'Exploitation Des Procedes Thomson-Houston.

Artificial resins particularly for varnishes, such as phenol and glycerol resins, are made soluble in organic solvents by dispersing them in esters of the aliphatic series, such as a glyceride of a polybasic acid.

Thermoplastic Rubber Products; a review. By F. Kirchof Kautschuk 4, 142-9-1928.

A critical review of the literature shows that the gutta-percha or chellac-like products obtained by Fisher from raw rubber by treatment with sulruric acid and sulfonic acids are essentially the same products which have previously been described by Harries and by Kirchhof. Priority for the discovery of sulfo-rubbers is therefore with the German investigators. From the technical point of view the application of these substances represents important progress, since the use of solvents is avoided. Thermoplastic substances in general are discussed, an attempt being made to classify these substances in four groups, according to their method of preparation and the reagent used: (1) sulfocylorubbers, comprising the sulphuric acid-rubbers of Harries and of Kirchhof and the sulfonic acid-rubbers (thermoprenes) of Fisher; (2) Thermocyclorubber, comprising the mon-cyclorubber of Harries and the hydro-cyclorubber and the poly-cyclorubbers of Staudinger; (3) photo-cyclorubbers of Porritt and of Asano, and (4) contact-polymer rubbers, comprising the metallic halide-rubbers of Bruson and the Cl_3CCO_2H rubber of the B. F. Goodrich Co. The methods of preparation, physical and chemical properties and probable chemical constitution of these substances are tabulated.

Thiourea Condensation Products with Aldehydes. British Patent. No. 287,-568, March 25, 1927, Ripper.

Thiourea or its derivatives which may be admixed with urea or its derivatives, is condensed with an aldehyde such as formaldehyde or its polymers to produce a hydrophobe resin which disintegrates on contact with water or acqueous solutions into a powder which may be molded under heat and pressure. Methylolurea and methylolthiourea also may be used as starting materials. Various details and examples are given, some of which include the use of fibrous or other fillers and auxiliary ingredients.

Manufacture of Cellulose Esters and Conversion Products therefrom. U. S. P. 1,701,229; Feb. 5, 1929. C. Ebert and T. Becker, assignors to I. G. Farben-industrie Aktiengesellschaft.

25 parts by weight of cellulose, as for example in the form of cotton, are acetylated at about 65/ C. with 75 parts by weight of acetic anhydride and 100 parts by weight of glacial acetic acid, after the addition of 0.25 part by weight of zinc chloride or cuprous chloride and 1.4 parts by weight

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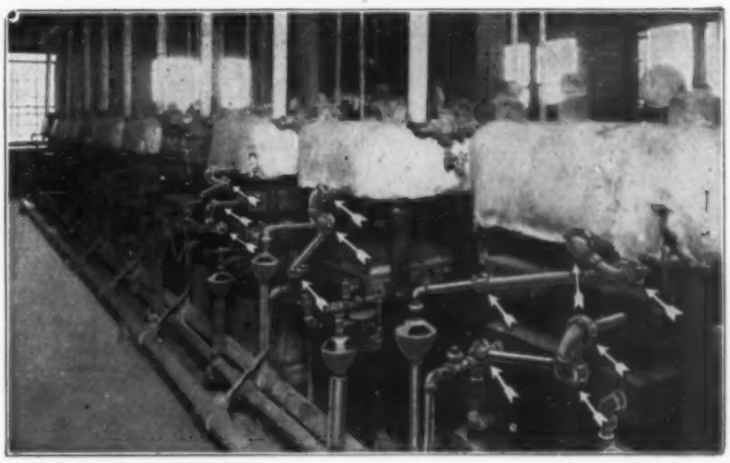

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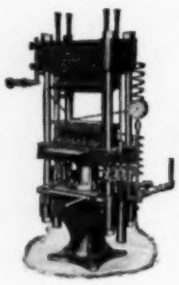

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of thionyl chloride. The cellulose thereby gradually passes into solution and the acetylation is completed after about 6 hours. The solution of primary acetate thus obtained is treated with 12.5 parts of water and kept at 45-50° C. until a test portion shows solubility in acetone or ethyl acetate.

1. Process for the manufacture of cellulose esters comprising the steps of effecting the acidulation of cellulose material with the acid of an acid anhydride in the presence of a halogenide of sulfurous acid and a heavy metal salt and hydrolyzing the same to form a cellulose acetate, soluble in acetone or ethyl ecetate.

Insulation from "Thiolite". French Patent No. 638,525, Dec. 7, 1920, Samuel.

An insulating material with feeble dielectric losses at high frequency is made by the addition to the insulating material such as "Thiolite" described in French Patent No. 549,811, of powdered quarts, silica, glass, mica or ebonite.

Insulating Material. British Patent No. 286,320, Sept. 8, 1926, Joffe.

A multi-layer insulating material comprises alternating layers of greater and less dielectric strength such as paper, wood, fabric, or metal treated with linseed oil, resin varnishes, enamel or other suitable materials. The thickness of the better insulating layers is less than 0.01 millimeter and preferably about 0.001 millimeter.

Aminoplastic containing proteids and cellulose. French Patent No. 636,-219, June 18, 1927, Schmidt.

Urea or its derivatives is condensed with formaldehyde and dehydrated in the presence of supports such as casein, cellulose, or its derivatives, mixed or not with softening agents, natural or artificial resins, or polymerized vinyl ethers, to obtain a spongy porous product.

Impregnating. British Patent No. 286,305, March 3, 1927, Manufacture de Machines Auxiliaires pour L'Electricite et L'Industrie Soc. Anon.

The operation of drying and polymerization are effected in a heated receptacle, and impregnation and evaporation of solvents are effected in a receptacle through which a current of air or other suitable gas is passed which is supplied by a fan and heated or cooled as required. Various details of apparatus are described.

Windshields from Aminoplastics. British Patent No. 286,250, March 1, 1927, Soc. Anon. Pour L'Industrie Chimiquie, A. Bale.

Sheets for wind shields of automobiles, flying machines, etc., are formed by uniting sheets of formaldehyde urea condensation product. Sheets of somewhat different character (details of the preparation of which are given) may be united under the action of heat and pressure.

Casein plastics. French Patent No. 638,023, I. G. Farbenindustrie A.-G, July 20, 1927.

Artificial horn is made from casein containing solid or liquid bases of the aliphatic, aromatic, or aliphatic-aromatic series or their salts or derivatives. Bases containing water groups, such as cyclohexylethanolamine, or their homologs or acyl derivatives are particularly suitable. An example is given of a horn prepared from casein and cyclohexylethanolamine.. The aliphatic-hydroaromatic-amines are prepared by joining hydroaromatic radicals with aliphatic radicals, one or the other of which contains an hydrocyl group. Examples are given of the preparation of cyclohexylethanolamine from cyclohexylamine and ethylene oxide, or form ethanolamine and cyclohexanone or form glycol chlorohydrin and cyclohexylamine.

Aluminum Molds. French Patent No. 638,010, June 30, 1927, Societe Industrielle de Caotchouc D'Argenteuil.

Molds for rubber, celluloid, etc., are made of steel surrounded with a casting of aluminum for lightness and rapid absorption of heat.

Molds coated by antimony-lead alloys. French Patent No. 638,008, June 25, 1927, Societe Industrielle de Caoutchouc D'Argenteuil.

The interior of molds for rubber, celluloid, etc., has a coating of metallic regulus, e. g., an alloy of antimony and lead.

Molded tape sound records. British Patent No. 285,065, Nov. 23, 1926, Smith, Smith & Wood.

In recording for the manufacture of records in tape form, the sound grooves are first made in wax in the usual way. Copper is then deposited on the wax to form a matrix and from this the record is impressed on a strip of celluloid or like material.

Cellulose Esters as Lacquer Bases; Cellulose nitroacetate. Paint & Varnish Manufacturers Association Circular No. 388, 657-72-1928.

The use of cellulose nitrate and acetate in protective coatings is briefly reviewed. Besides these the authors have prepared the borate, phosphate, formate, propionate, butyrate and benzoate of cellulose. These compounds were usually dark in color or lacking in certain other physical properties for use in lacquers and are not of commercial importance at present. The advantages of cellulose ethers are described. Methods are given for the preparation of cellulose nitroacetate which appears to have very desirable properties for use in lacquers. It is much less inflammable than the nitrate and films showed higher tensile strength than those made with either acetate or nitrate.

Increasing convertibility of cellulose into its derivatives. French Patent 642,220; Oct. 13, 1927. Interessengemeinschaft Farbenindustrie. A. G.

In order to render cellulose more amenable to treatment with estrifying agents it is given a treatment with certain so-called "softening agents" as propylnaphthalenesulfonic acid or its equivalents. This is especially applicable for the prepara-

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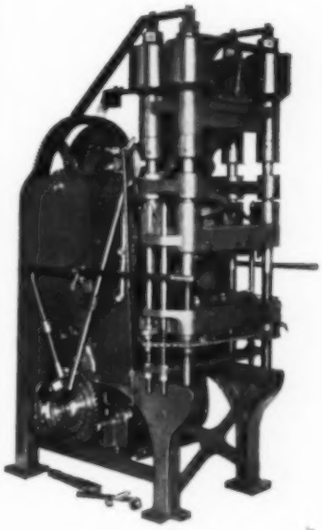

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Synthetic Plastics—A Romance

(*Continued from page 323*)

sufficient for most applications and it will stand considerable heat without deterioration.

Phenol plastics when dissolved in a suitable solvent, are marketed under the name of Varnish or Baking varnish. This Varnish is also used as a protective coating for metals, wood, etc. where it would be impossible to mold a coating of the phenolic molding compound on the object. Where metals come in contact with acids in the form of gases or alkali sprays or solvents such as Alcohol, Benzol, Toluol or Xylol, due to the fact that phenolic plastics are impervious to acids, alkalies and solvents, they have, in a great measure, protected these metals from corrosion; at the same time preventing the accumulation of undesired discoloration or unwanted metallic salts in the product being manufactured therein.

Phenolic varnish can be impregnated into paper, canvas or other materials and this material when pressed is known as punch stock or laminated material. Punch stock is found in almost every piece of electrical equipment and hardly a controller or relay is made or used in which there is not some used. Laminated materials are made into gears and pinions and when so made, resist corrosion, help to maintain production schedules as well as to reduce maintenance cost in the chemical industry where corrosion and disintegration cause the greatest amount of trouble.

Plastics of Beauty

There is also another side to phenol plastics, which though it has no great influence on the production of the chemical industry, is taken into account and is apparently appreciated. This has reference to many articles which are used; in the office and display rooms of the chemical industry such as, new type telephones, office and desk equipment which when made from phenol plastics, add a touch of

beauty to the every day things which are a necessity for the carrying on of business.

Besides these helps to the industry itself, phenol plastics have swelled the total poundage of consumption of chemicals in that the business is now using millions of pounds of phenol and formaldehyde which were not being used years ago, thereby opening new markets for the production and sale of benzol and industrial alcohol. It has also added to the production figures of the following inindustries; the dye industry by the consumption of coloring matter, and heavy chemicals by the use of their products in their manufacture.

Doll Heads

(*Continued from page 330*)

be found that with the exception of the fin above referred to the head surfaces are perfectly smooth and that the facial features are very sharply delineated. It is, therefore, unnecessary to subject the head surfaces to an abrasive action by sandpapering, the only requirement being to remove the projecting fin of composition material which can be easily and quickly accomplished. Thereafter the head surface can be painted or colored at the appropriate places to enhance the lifelike appearance of the head.

It will be seen from the foregoing that the core support 18 constitutes in effect a third mold section since it closes the open end of the mold chamber formed by the complementary cavities in the mold sections 6 and 11. Thus, as seen in Fig. 1 of the drawings, the mold chamber is substantially completely closed when the molding pressure is applied to the plastic material, the only point of escape for the excess material being between the opposing faces of the mold sections 6 and 11 whereby the fin 27′ is formed.

In some cases, the plastic impression receiving and retaining material may be applied to the core 24 before the core is mounted on the support 18 by dipping the core into a mass of such material of the proper consistency. This material being of an adhesive nature, will adhere closely to the surfaces of the core and provide a coating of the desired thickness thereon. The surface of this coating will, by contact with the atmosphere dry quite quickly and sufficiently to prevent its adherence to the surfaces of the mold sections. The underlying portion of said coating however, remains relatively soft so that it will readily yield to the molding pressure whereby the details of form and contour will be sharply delineated in the surface of said plastic coating.

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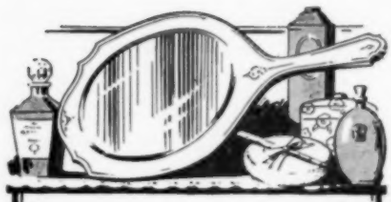

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Vol. 3 JUNE, 1929 No. 6

Molded Products at the Chemical Industries Exposition

Many types of plastic material shown in a multitude of finished forms

THE Molded Products Industry, and including for the moment under that head all fabricated articles in a finished or partly finished state that come within the scope of this publication, made a truly impressive showing at the Twelfth Chemical Industries Exposition held in the Grand Central Palace in New York City during the week May 6th-12th.

For the most part, the finished articles were exhibited by the manufacturers of the unfabricated raw materials, either in powder or solid form, since the exposition was a chemical one rather than of a general industrial arts nature. It is the production of the raw material that is a chemical or technical problem while the molding of the article is really a highly skilled art.

But the fact that these manufacturers exhibited their customers' as well as their own products was significant of the truism that the molded product and its possibilities had a universal appeal. It was convincing evidence that molded products may have provided the solution to almost any exposition visitor's problem, for many chemists, engineers and executives came to the exposition repeatedly to learn what the latest developments were in materials, methods, and equipment in one phase or another of chemical technology.

In addition to the displays of materials and finished products, there were several exhibits of molding equipment and accessories, all of which will be described in turn.

Bakelite Corp.

AT the Bakelite Corporation's booth, the lay visitor as well as the chemist was permitted to understand how unpromising materials created in the research laboratory are transformed to play a part in the industrial work of the world. It became evident, for instance, that materials like phenol, formaldehyde, asbestos, and finely ground wood may appear eventually as door knobs or telephone instruments.

The Bakelite exhibit this year included several hundred items, and was the most complete exhibition to date of this new American industry. The phenol resinoid industry is American both in its inception and development, being based on the researches of Dr. L. H. Baekeland, Professor of Chemical Engineering at Columbia University. It was he who introduced the word "resinoid" as a technical name for these raw materials. He was earlier known for his invention of Velox photographic paper. Bakelite materials now play a part in practically every type of industry, and one learned at the Exposition that the uses range from the chemical factory to the electric power house, from railroading to aviation, and from rayon to radio.

A series of colored panels drew attention to the versatility of this invention by showing its relation to the making of lacquers and enamels. Bakelite air-drying lacquers have properties which make them both decorative and protective. The subject of lacquers has in recent years received much attention, and automobile manufacturers and interior decorators, as well as chemists and laymen, are on the watch for new trends.

The molded material is used in so many ways that it is difficult to know where to begin in description. One surmised during his scientific pilgrimage that tin is no longer the desideratum for tooth paste caps, and indentified the lustrous materials which

is providing caps for containers of depilatory or shaving cream. Bakelite Corporation presented its display in an unusual and artistic setting, in the manner of ecclesiastical Gothic. Recessed panels provided for indirect illumination, and permitted easy classification of resinoid use in leading industries, an appealing feature to the visitor who must rely on various exhibitors to aid in simplifying the problem of inspection, in the maze of national expositions.

Barco Manufacturing Company

Of interest to molders, too, was the exhibit of the Barco Manufacturing Company, makers of swing joints. These have found application in steam-heated platen presses used in the rubber tube, heel, tire and plastic molding trades. Two types of joints are made, one, a swivel joint, which permits rotary movement only, and the other a ball joint which combines rotary and angular movement. A set of these were rigged up at the show and their method of operation was demonstrated by Mr. Ross.

Becker-Moore

Becker-Moore & Company, Inc., of North Tonawanda, N. Y., largest wood flour manufacturers and an important factor in supplying this substance to plastic molding composition manufacturers were also at the Exposition. Presided over by Mr. Moore, they showed at their booth, various grades of wood flour and pointed out the possibilities and advantages in using it in a wide range of products. Several articles in which wood flour is used were on display, including inorganic molded products, like the lamp base seen in the photograph of the Becker-Moore booth.

Fred S. Carver Co.

Mr. Carver had set up several of his laboratory size hydraulic presses for various purposes, among which was one with electrically heated platens. On this very sturdy little press he can mold the phenolic molding powders in very much the same way as the large steam-heated, commercial size presses. It is very well suited for laboratory molding.

Celluloid Corporation

A booth that drew a great number of wide-eyed spectators was that of the Celluloid Corporation. Here was shown a wide range of molded cellulose acetate articles that for variety of color quite took one's breath away. Greens, pinks, whites, pastels of all shades are apparently possible and practical in cellulose acetate. Clear transparent articles, with just a tinge of yellow in them, were also said to be molded out of powders.

A point that the observant molder could not fail to grasp was that the articles exhibited were made in the identical molds that are used for resinoid molding. The Celluloid Corporation's staff, including Mr. R. L. Simmonds of the Development Sales Department, and Mr. A. J. Steinberger of the Technical Service Department, deserve much commendation for their missionary work in demonstrating to doubters that cellulose acetate powders are molded without any undue difficulty and that these powders can produce as good a molding job as any other material, in a riot of color that undoubtedly appeals to the customer's eye.

Custom Molders Make Up Lumarith Samples

Some of the molded products shown included cigarette humidors by Colt's Patent Fire Arms Manufacturing Company, desk sets and vanity boxes by Kurz-Kasch Company, wall brackets and clock cases by Northern Industrial Chemical Company, telephone mouthpieces and receivers by the Siemon Company, switch plates by Allen and Hills, cigar lighters and gear shift balls by General Industries Company, and ash trays by Kuhn and Jacob.

The caption under the Celluloid Corporation's sign at the exposition read "Cellulose Acetate Products". Enquiry elicited the information that this statement was not meant to be prophetic; that pyroxylin plastics were excluded from the exhibit merely because of the laymen's fear of the inflammability of 'celluloid'; that the production of pyroxylin plastics will continue as long as there is a demand for it. However, the cellulose acetate molding powder certainly seems to have arrived.

Continental Diamond

The recently consolidated Continental Diamond Fibre Company was at a booth where they had on exhibit vulcanized fibre, and laminated products as well as Celoron molded products. Continental-Diamond goes into many industrial applications for its output, among which the rayon industry is noteworthy. Several laminated and molded parts for rayon spinning machinery were shown, also an acid resisting, laminated-walled truck for moving wet yarn through the plant. Paper spoons and pliers for high tension work were interesting examples of vulcanized fibre articles. Celoron molding powders are used in the usual line of molded novelties and smoker's articles.

Erinoid

The Erinoid Company of America was another exhibitor of plastic solids, showing a wide variety of both ornamental and useful articles which can be fabricated out of casein materials. Noteworthy among these were several toilet sets, including trays and powder jars, made up in sea-pearl effects.

A new range of buttons and other dress and millinery ornaments were also exhibited. A novel article was a cigarette holder which looks exactly like a fountain pen and which can be carried in the vest pocket.

General Plastics

General Plastics, most certainly accomplished their purpose in the display of Durez which was apparently to show the diversity of work done with Durez, as well as many of the new developments of the past eighteen months.

In Contrast With a Medieval Background Bakelite Brought Forth Molded Products Used in Industries Ranging From Aviation to Rayon

Color Was the Keynote of Karolith in Both the Molded and Solid Stock Forms of Its Casein Plastic

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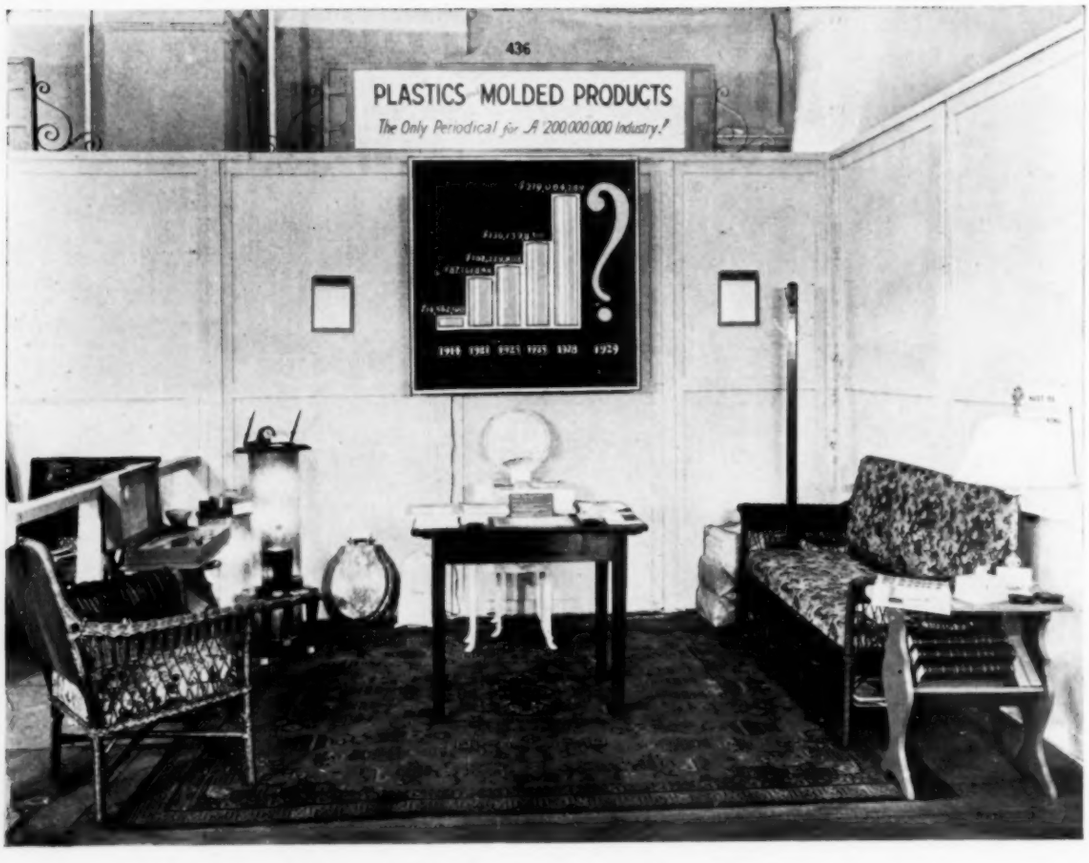


The Exhibit of "Plastics and Molded Products"

'Seeing' and 'Being Seen' at the Chemical Industries Exposition

By Nicholas Klein
Editor, Molded Products

IT was fundamentally a two-fold purpose that prompted Plastics and Molded Products to participate in the recent chemical Industries Exposition. In its essence it amounted to a matter of 'seeing' and 'being seen'. That this had been accomplished, the staff can heartily attest to, for it turned out to be a week of highly concentrated speech-making on the place of Plastics and Molded Products in the scheme of things plastic, and equally strenuous listening to the widest range of queries, theories, problems and what-not that visitors at the show had to offer.

18,000 People at the Palace in Six Days

According to the official figures 18,000 individuals visited the exposition during six days. No count was made of the number of times such people, who turned in their original invitations for season passes, returned for subsequent trips. Out of this total, Plastics estimates that 2000 people stopped at their booth number 436 and of these about 1000 had more than a passing interest in the field of synthetic plastics, as evidenced by the number of copies of the March, April and May issues that were distributed.

That Plastics and Molded Products was being 'seen' by these people could not be doubted. The sub-head on the sign stating that it was "The Only Periodical Serving a $200,000,000 Industry" served as a magnet in more ways than one. At least three chemical engineering professors in ranking institutions of technical education felt they should use Plastics either in their courses covering Materials of Chemical Engineering Construction or in the libraries. Several gentlemen of financiering inclinations felt that here was a field, that they were never exposed to, which might profit by their own peculiar qualifications. But most flattering to the editorial staff was the comment of technical men who had been working in the field of plastics for as long, some of them, as fifteen years without ever having heard of the existence of this publication. At least thirty such either decided on the spot to subscribe or felt that their companies would promptly send in a check.

The same was true of a large number of fabricators of plastic materials and users of fabricated or molded plastic parts in many of the fields that these products find application. Plastics and Molded Products appealed to these people as the one medium that was devoted exclusively to this field, that it speaks with the authority of a specialist on both scientific and technical phases as well as the merchandising and economical angle of the industry.

Telling The World What Makes a Plastic

Plastics and Molded Products felt that it aided the general welfare of the industry when it acted as tutor to so many who came to the booth, attracted by the display of the several types of plastic materials, with the question, "Which of these do you make?" By telling these people that there were various kinds of plastics, each more or less with specific applications; that an amino-plastic and a phenoplastic had mutual advantages and limitations, that a pyroxylin plastic, pearl effect sheeting covered bathroom stool did not represent a frightful fire hazard; that cellulose acetate lampshades did not behave like "celluloid", all these points tended to make the layman better appreciative of molded products. It awoke in him, as the ultimate consumer, a more discriminating taste in future purchases.

'Plastics' Offers Soft Chairs and Good Cigars

Plastics and Molded Products was very happy to act as host to the many people in the industry who made the booth their headquarters while at the show. Several times two or three molders sat down to what sounded like pleasant conversations. Materials people who did not have booths of their own met clients or prospective clients at the Plastics booth. In a word, it was a clearing house for all sorts of information pertaining to the industry during the course of the entire exposition.

Among the samples of molded products displayed at the booth were a Bakelite cocktail set by Chicago Moulded Products, Durez desk set molded by Norton Laboratories, various articles sent by Wilbur and Williams molded out of Luxite, Catalin poker set and vanity, dressing table and chair by Standard Specialties Co. in Amerith, Du Pont Viscoloid Co.'s table lamp, a set of Lucite toilet ware and Bakelite ash-trays by Allen and Hills.

In retrospect, Plastics and Molded Products is pleased to have made the acquaintance of so many very interesting people, many of whom it had known only by hearsay, and which it hopes to mold into a lasting friendship. To those friends who had not previously known of its scope, it gives its assurance to work as sincerely as ever to help make the figures on its prettily illuminated graph grow even in greater proportion than in previous years.

The Cleveland Disaster and Its Lesson To The Cellulose Plastic Field

By J. F. Walsh and T. E. Alcorn
Celluloid Corporation

THE recent disastrous fire in the Cleveland Clinic has focused attention on the inadvisability of using highly inflammable nitro cellulose film for X-ray purposes, particularly under conditions of improper handling and storage facilities. Nitro cellulose films are one of the many forms of nitrocellulose plastics and for this reason it is felt that it would be well for all those interested in the use and manufacture of them to resolve that such a preventable disaster must not occur again.

It is a generally recognized fact that nitro cellulose products on combustion liberate carbon monoxide, nitric oxide, nitric dioxide and compounds of cyanide which if in high enough concentration form explosive mixtures and are extremely toxic. Also, in the case of sensitized films, bromine and various other highly poisonous compounds are generated. Although it is hardly conceivable that these gases could have been the sole cause of the terrible effects from which the victims suffered, the verdict of the first investigators seems to be that the ingnition of the inflammable film was the direct cause of the disaster.

Despite Hazard, Nitro Stocks Still Are Stored Carelessly

In spite of the large amount of educational work that is being carried on to stress safety in industry and the home, nitro cellulose products even though potentially hazardous are being used and stored in many instances under very unfavorable conditions. Without doubt their use would have been greatly restricted long ago if it had not been for the advent of modern heating appliances, electric lights and intelligently directed educational campaigns in their use and storage. The modern methods of removing static charges, the use of fire proof storage cabinets, adequate automatic sprinkler protection and safe house keeping practices have all contributed to the extended use of nitrocellulose products with remarkably few serious accidents directly attributable to their use. However, the basic fact remains that many of the present types of nitrocellulose materials are highly inflammable and a potential hazard, and as such must be handled, stored and used under conditions of maximum safety in order to avoid disasters such as was experienced at Cleveland.

These facts have long been recognized by the Celluloid Corporation as a result of which they have developed and advocated the use of Cellulose Acetate film for X-ray work in clinics, hospitals, doctors' and dentists' offices where quantities of films are likely to be accumulated or stored over long periods, and under conditions where more attention is given to what the film shows than to the characteristics of the basic material or the conditions under which it is used or stored. It is obvious that a surgeon intently examining an X-ray of a patient's interior anatomy, and searching for an elusive trouble, is but little concerned with the fact that his cigarette is dangerously close to a highly inflammable material, or that quantities of such materials are improperly stored. Such conditions can only be corrected by the use of less hazardous products.

Two types of film are available; one made from nitrocellulose which is highly inflammable, the other made from cellulose acetate which is slow-burning and has been classified by the Underwriter's Laboratories as offering no greater hazards than common newsprint. This last burns only with difficulty and its products of combustion are practically harmless.

Pyroxylin Solids Are Less Dangerous Than Thin Film

These same facts hold true to a slightly lesser degree with nitor-cellulose products other than film. Film is the most dangerous product of the nitrocellulose plastic industry for two reasons; fiirst, it is in very thin strips, usually less than 10/1000 of an inch in thickness, and these strips are often of such length that if they are unrolled or scattered while burning the flame will travel rapidly over a wide area. Secondly, film is made from a base material of high nitrogen content (usually around 12.00%) and the rate of burning increases with the nitrogen content. On the other hand, plastic sheets, rods and tubes are sold in thicknesses greater than 10/1000 of an inch, often up to one inch, so that the material is more compact and dense. Moreover, this type of plastic is made from nitrocellulose of a lower nitrogen content (usually 11.00%) and for that reason burns less rapidly. Another factor which reduces the rate of burning here is that the plasticizer content is greater. But even allowing for these differences, nitro cellulose plastic materials are highly inflammable and hazardous and must be stored and used with due care. The Celluloid Corporation has through the years devoted a considerable portio nof its research facilities to the development of

(*Continued on page 361*)

The Airplane Industry Uses Molded Products For Strength and Lightness

Westinghouse Micarta, Molded and Laminated Finds Many Applications in Modern Aircraft

THE airplane is daily encroaching upon the automobile, the railroad, the steamship, in a word, upon all the more commonplace modes of transportation. And being the most modern means of annihilating distances, it turns to the synthetic plastics, in both its molded and laminated forms, as a modern material to serve for some of its parts in withstanding the terrific strains it undergoes in accomplishing its tasks.

One of the earliest applications of plastics in aeronautics was the laminated propeller. The Westinghouse Electric and Manufacturing Company introduced Micarta propellors in the latter part of the World War to replace the fragile and inefficient wooden type. They are now built to fit most of the high grade engines that are daily performing feats that rate front page newspaper space. Among such engines are the Wright Whirlwind, Ryan-Simens, Anzani, Curtiss, Hispano, Hall Scott and others.

The characteristics that distinguish laminated propellers as against the old type wood and metal blades are resistance to moisture, oil and salt spray, freedom from vibration and flutter, proper and uniform balance. The laminated blades are fitted to metal hubs which permit the pilot to change the pitch on the field with only a wrench, should flying conditions demand this. Laminated micarta propellers are light, the molded resin-filled fabric having only half the density of aluminum.

Molded plastic pulleys, unlike metal, do not weaken control wires.

Control cable pulleys of molded micarta are now standard equipment on many commercial aircrafts. These pulleys serve to carry the cables which actuate the rudders and elevators and must obviously be strong and light. Micarta pulleys do not develop flat spots in contact with the cables nor do they cause as much wear on the cables themselves as metal pulleys would. This prolongs the life of the cables and gives a greater factor of safety in flying.

The acceptance of Westinghouse micarta propellers and pulleys by the aviation industry led to the development of other parts for aircraft use. Next in line came molded tailwheels. Here again metal was replaced with a lighter and stronger piece molded from a laminated fabric material which is well suited to withstand the severe service to which tailwheels are subjected.

Strong, molded tailwheels withstand much abuse in landing and take-off.

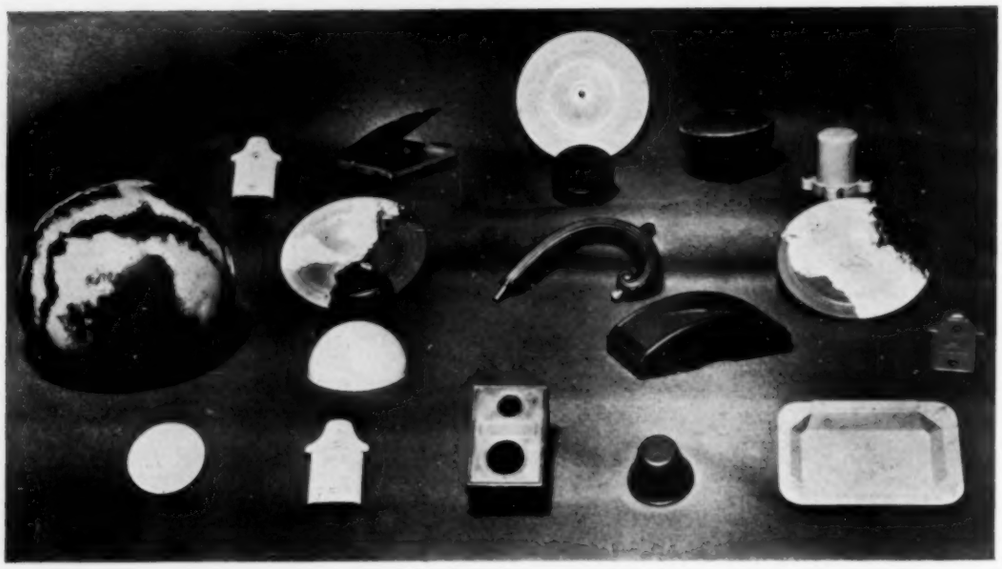
Fairleads also have been molded out of the same fabric base material. These are tube-like affairs which are designed to guide the control wires. They prevent wear on the cable and also on the frame structure by not allowing the cable to drag over any structural members. By molding the fairleads in two halves and joining them with bolts, either one or both worn parts may be replaced without disconnecting the control cables.

Molded hinge bearings firmly support rudders and elevators

Molded hinge bearings have been substituted for metal parts for suspending such vital movable airplane members as rudders, elevators and ailerons. Here is another instance where metal is replaced by a molded part where a combination of lightness and mechanical strength is required.

Laminated molded plates are utilized for lining cabins and cockpits in modern aircraft. Micarta laminated finds wide application in this way because such resinoid products are fire-resistant, sound-proof, and impervious to moisture. It may be finished in designs that make up a pleasing interior without impairing any of its characteristic mechanical properties which make it so valuable in aeronautics and other industrial applications.

Molded fairleads minimize aircraft structural strains.



Another Light-Colored Material Is Introduced to the Molding Industry

"Luxite", produced abroad for years by Pollak, now being distributed here by Wilbur & Williams

THROUGH Luxite molding powder, articles can now be had in al clolors ranging from pure white, ivory, brilliant translucent hues—to even the most delicate pastel shades, as well as unlimited color combinations.

Luxite articles come from the press with a high polish, in a most uniform condition, and are of exceptional strength and durability. Outside of temperature—*which must be kept fairly constant between 270° and 285°F.*—the molding procedure is practically the same as used with the ordinary phenolic molding powders. Luxite molding powder flows most easily in the mold, which allows highly intricate mold cavities to be filled within the regular molding time, thus assuring uniform production.

The conservative policy of Dr. Fritz Pollak, inventor and patentee of Pollopas, has lead to a gradually increasing interest in his formaldehyde plastic, and incidentally to various rumors as well as attempts at manufacture of similar compounds, some of which have met with moderate success. For a long period the sale of Pollopas was limited to local European demand, pending perfection of manufacturing technique, but it is now being offered to American molders by the Wilbur & Williams Company, under the name of "Luxite".

Molders Realize Possibilities

The few molders who were first offered an opportunity to use this material were aware of the tremendous sales possibilities which it opened to them, and it is said some of the largest molders in the country are setting aside a number of their regular presses for this colored work. From the molders' viewpoint this is an excellent material for use because the regular presses used for phenolic compounds can be utilized, although both heat and pressure should be considerably less than for phenolic powders. The free-flowing qualities of "Luxite" have frequently been remarked upon.

High luster, depth of color, dielectric strength, great elasticity, resistance to fracture, noninflammability and lightness of weight are some of the attributes of products molded from this compound.

Luxite can well be used wherever beauty of colors, exceptional strength, and uniformity are essential. Among the articles to which Luxite is particularly well adapted and for which there is considerable demand may be mentioned:—clock cases, electric appliance handles, electric fixtures, smoker sets, desk sets, automobile fixtures, toilet sets, serving trays, lamp bases, door knobs, as well as an almost unlimited number of other articles.

Popular translucent colors include: brilliant red, jade green, bright yellow, light blue, tor-

(*Continued on page 363*)

The First Ten Years of Casein Plastic Production in America

The Story of the Aladdinite Company as Told to Molded Products by Mr. P. C. Christensen

AS industries go in the United States, the plastic industry may certainly be classed as an infant industry. Even so, mile-stones are reached that are worthy of a moment's pause for consideration in the hectic rush of the infant toward maturity. At this instant it is the casein plastic industry that claims our attention for it is exactly ten years this month that the Aladdinite Company began the commercially successful production of casein solids in the United States.

War Stops Supply

The foundation of the casein plastic industry was caused by the cutting off of the foreign sources during the war. With the end of the war, shipments were not immediately resumed because of the financial and industrial demoralization abroad. The demand for ornaments was heightened in this country by continued prosperity but no technical skill was available to fill this want until hostilities were over because the production of munitions certainly was deemed more important than decorating ladies' hats.

At this time, early in 1919, two men in the laboratories of Thomas A. Edison discussed the need of an American casein plastic. One of these was Dr. Banks, the Edison plant physician, who had a number of acquaintances in the casein plastic fabricating field. The other was Mr. P. C. Christensen, who had been a trusted assistant of Mr. Edison for fourteen years. With the training obtained in the Edison Laboratories as a background, and the realization of its possibilities, Mr. Christensen began his casein plastic experiments in February 1919. By June of that year, financial backing was obtained, a small frame building was purchased in Orange, N. J., and equipped, and casein sheets and rods were actually produced and sold for the first time in America by the Aladdinite Company, a statement which Mr. Christensen says has never been questioned.

P. C. Christensen
President, The Aladdinite Co.

Blazing Trails in Casein Plastics

Obviously, all of this was pioneer work with its attendant headaches and heartaches. First of all, the principal raw material, casein, is a natural product and even so phlegmatic a creature as a cow does not yield a consistently uniform output. Casein varies in quality with the season, the pastures, and even less weighty factors that tend to jar the cow's temperament. This situation could be eased only in one way and that was by finding a single source large enough to blend batches of casein so that a practically uniform year-round source of casein was available for Aladdinite. This, Mr. Christensen soon succeeded in accomplishing. Many of the novelty trades demanded delicate colors which had to stand up under heat and pressure and the various other processes in the manufacture of the solid stock. This also caused much trouble in the early days. Tinting casein which was cured for weeks and months in hardening baths was a problem in a class by itself but that was solved to the customers' satisfaction by a thorough study of the nature of the changes that such lengthy immersion caused in the dyes and pigments. Casein plastic solids must machine and turn readily without causing tools to become dull too easily and must take on a very high polish. Mr. Christensen prides himself on the fact that Aladdinite was soon accepted by the trade as not only filling these requirements, but also as being a material that gave a 100% yield of articles without any risk of discarding any as seconds because of faulty raw materials.

The Future's Promise

As to the possibilities for growth of casein plastics, Mr. Christensen thinks the industry is just in its infancy. During the past ten years, he says, casein solids consumption has grown from about 200,000 to 1,000,000 pounds per year but that within the second decade this should increase twenty five fold. Production is now principally in the control of three

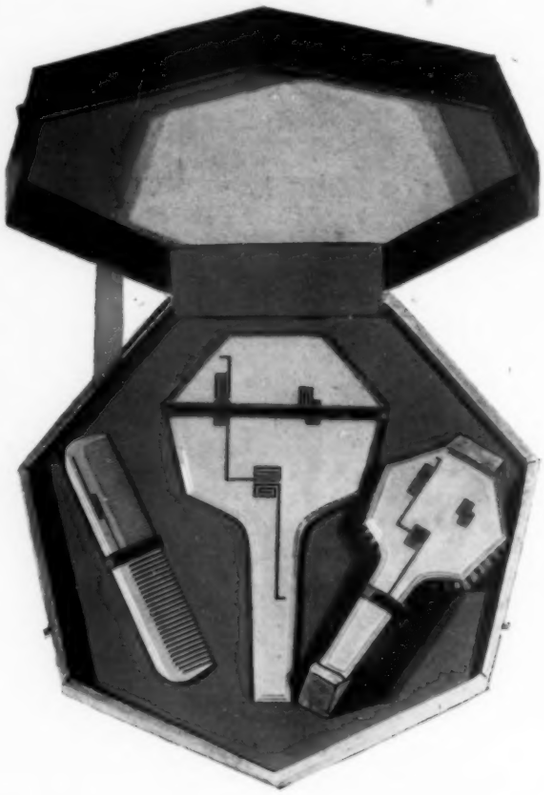
companies and Mr. Christensen feels confident that these three units could comfortably meet this enormous increase in demand even at this moment without installing any additional facilities. The Aladdinite Company alone could manufacture five times its present output on very short notice.

Casein plastics will tend more and more to go into the making of larger articles in this country. Mr. Christensen thinks the ability of Americans to pay for plastic products of the unquestioned beauty of which casein is capable, is the principal determining factor. This has been borne out in the history of the industry. When articles fabricated out of casein solids were first introduced in Germany thirty years ago, they were indeed very small. Fifteen years later, when England entered the field, the products became somewhat larger in size due to the comparatively greater purchasing power of that market. When casein plastic articles entered the American market, they made a bid for the business of a consumer that could well afford luxuries on a broad scale and casein plastics went to articles of considerable size, so that the demand for this plastic substance promises to continue at an ever increasing pace.

Work on Molding Casein

The problem of speeding the cure of casein down to a matter of days as against weeks and months was another that has engaged the attention of the Aladdinite Company. Mr. Christensen says that the ideal has not been attained yet. He has, however, after conducting many experiments, developed a method for speeding up the cure of casein plastic with a partial molding method which he has successfully used for the past year in producing small articles, such as buttons. With the entire process consuming only six days from start to finish he has been turning out 1000 gross buttons a week, in various mottled effects as well as pure white. Mr. Christensen feels that this procedure can be improved and that casein can form a perfect molding material.

An interesting feature about the Aladdinite Company is the Thomas A. Edison sentiment which seems to pervade it so strongly. An inscribed photograph of the great inventor adorns a wall in the office. Many of the men in the plant have been with Mr. Christensen since he started business, some of them came with him from the Edison works. There is an unmistakable sense of loyalty and friendliness existing between superintendent and workman. Mr. Christensen says that Mr. Edison always maintained that it takes seven years to commercialize a new technical process. He feels that with the steady gain in production of casein sheets and rods as well as the satisfactory operation of his molding process this stage has been attained and that the Aladdinite Company is in a sound and healthy condition.

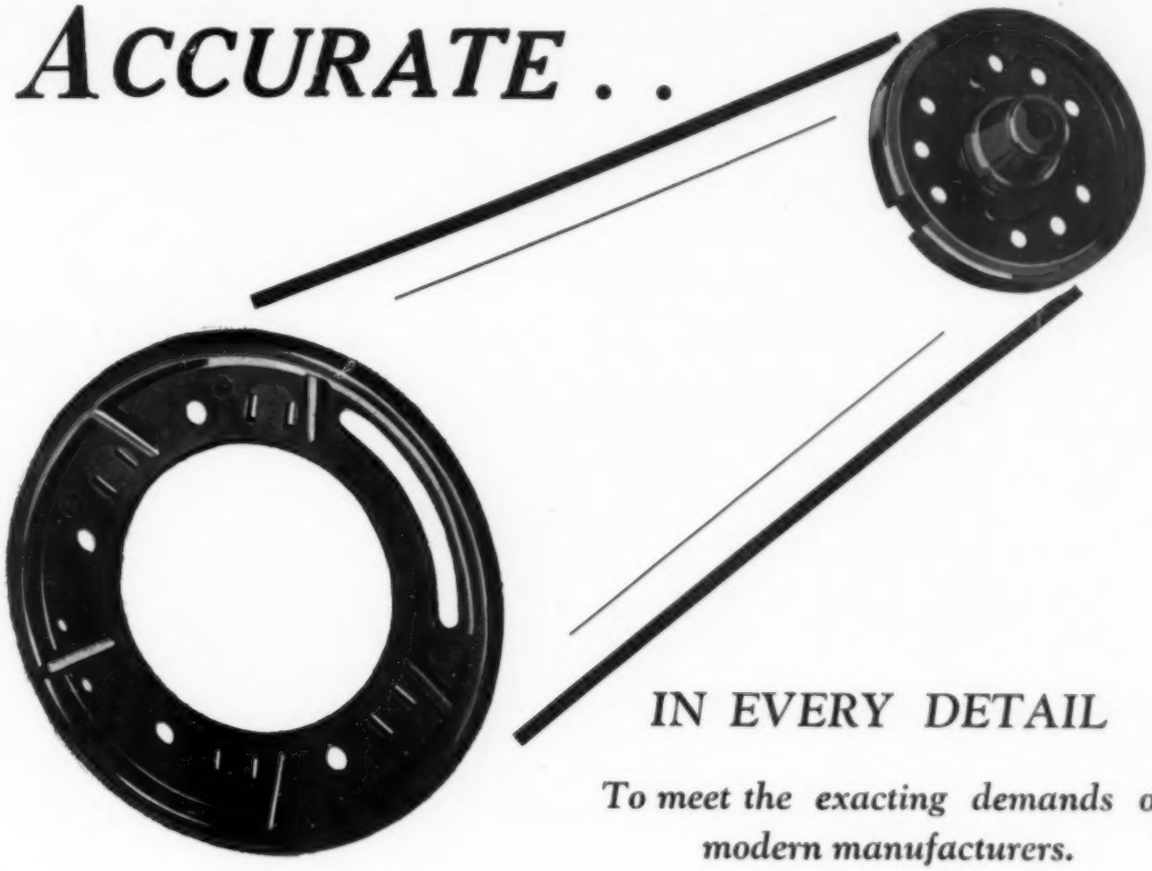


Celluiold Corp. Shows Translucent Toiletware in Modern Style

The Good Housekeeping Institute of New York City has selected this new toilet set by the Celluloid Corporation as being decidedly in good taste and has used it to set off a dressing table in a modernistic boudoir at their permanent exhibit.

The material is a new translucent pyroxylin plastic for which the name 'Amerlite' has been adopted. These translucent plastics serve very well, in the softer pastel shades, to modify the illusion of rigidity that so often is created in modernistic settings. The set illustrated here is applegreen decorated with black while the pieces shown by Good Housekeeping are coral decorated with gold. A third combination of tan and silver is also made. Toilet ware made of 'Amerlite' is sold in sets including up to fourteen pieces.

ACCURATE . .



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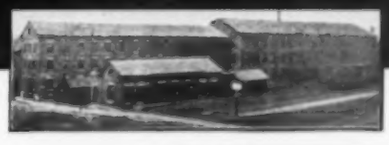


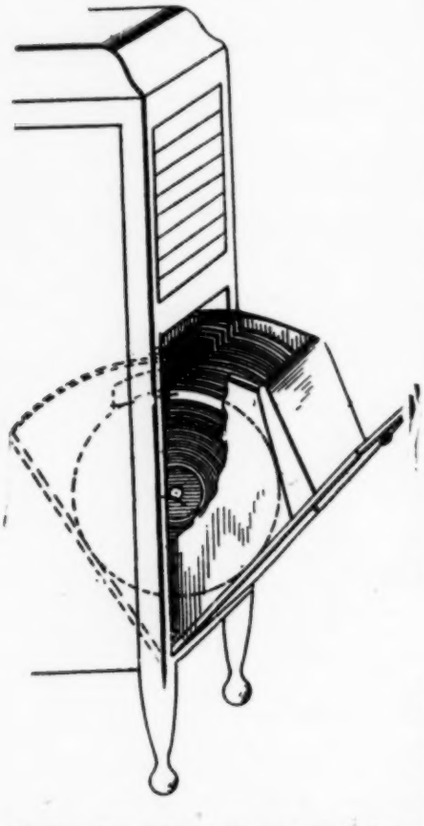
Auburn Plant, Auburn, New York

A Novel Molded Phonograph Record Makes Their Selection a Simple Task

Combination of Shellac Record and Pyroxylin Tab Permits Reading Title Without Removing Disk

LISTENING to your favorite dance orchestra or vocal or instrumental artist as recorded on the phonograph may be your idea of the ultimate in pleasure in this day of the universal radio. Yet the music-lover who likes his music when he feels in the mood has plenty of trifling annoyances to cope with when he gets into that mood, especially if he has a large library of records. Chief among such nuisances is the difficulty, by present methods, of finding the record before his patience is gone and he is more fit to weed the garden than listen to the Philadelphia Symphony orchestra.

Finding a phonograph record, until a combination of plastic materials offered this solution, meant turning over countless pages in record albums, peering at the titles in the circular opening at the center of both sides of the record and never having enough hands to keep the records from sliding out and spreading themselves, sometimes in many pieces, all over the floor. Another, and even more ancient method, was to keep the records in their original wrappers tucked in drawers in the phonograph cabinet, in which the titles were even harder to read than in the more modern record albums.

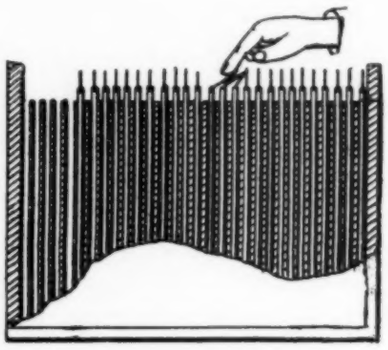


Showing how tabs stand vertically when cabinet is opened.

However, the invention of Keith M. Hall of Lac du Flambeau, which is a molded article combining shellac composition and pyroxylin plastic, completely does away with this nuisance and makes the task of finding phonograph records infinitely easy. The record itself is made in the time-honored fashion with the title on the center for those who prefer it that way. In addition, though, an identification tab made of a flexible material like pyroxylin plastic is imbedded in the record so that it projects beyond the edge of the record. This tab is just large enough to have printed upon it such necessary information as the title of the composition and the name of the recording artist. Where the tab is used on double-faced records, an opaque material may be used so that both sides may be printed upon without making the titles any the less readable.

Cabinet Patented Also

The records fit vertically into a cabinet, which is also covered by the same patent. They rest rather closely, one beside the other, as the illustrations indicate. When it is desired to select a record, the fore finger may be moved along the tabs and the titles very easily read. Both sides of each record may be read as the finger progresses for while the tab is pressed down, one side is noted and, as the finger proceeds to the next tab, the last preceeding tab will return to its original position and the reverse side of the tab is very clearly discernable. The



Titles are easily read on flexible tabs.

advantage in using pyroxylin plastic material in the tab is that normally it will stand in the same plane as the record and after being bent will spring back in place again. After the desired title is found, the tab serves as a very useful handle by which to the record is picked out of the rack.

The tabs may be made in various colors to distinguish the various types of music recorded. For example, dance music may be blue, vocal music red, and so on. This further facilitates an orderly arrangement of records without requiring recourse to any other outside indexing system such as cards and the like. All in all, this method of classifying phonograph records is a worthy application of the plastic molding art and again proves the industry capable of adding to man's pleasure and comfort.

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SUITABLE for the perfectly appointed table is this handsome Textolite molded timer box, molded by General Electric for the Edison Electric Appliance Company. Assembled, it serves as a convenience outlet for electric appliances. ¶ The rich green and ebony finish, which enhances the modernistic design, comes direct from the molds —no polishing, no machining. And it will last a lifetime without refinishing or polishing. ¶ In this timer box—and in all products of Textolite molded—are incorporated all the experience and technique acquired by General Electric in producing half a billion moldings. ¶ Thus Textolite molded, attractive, durable, dielectric, combining General Electric's unexcelled facilities for research and for production, gives *complete* satisfaction to all users of molded parts.

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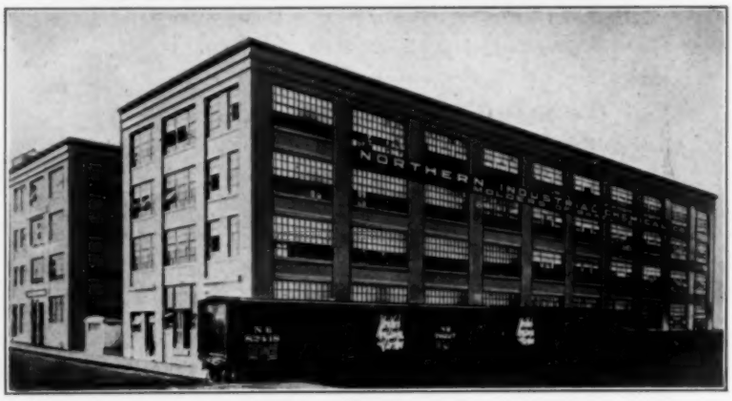

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News of the Industry

Continental Fibre and Diamond State Merge

The Continental Fibre Co., of Newark, Del. and the Diamond State Fibre Co., of Bridgeport, Pa. have recently merged and are now continuing combined business as the Continental-Diamond Fibre Co. with headquarters at Newark.

In writing to Plastics and Molded Products about the consolidation, Mr. J. P. Wright, president, says, "There is not very much to tell in regard to this transaction, except that it has as a matter of fact transpired, and the two Companies mentioned are now consolidated and are operating under the name of "Continental-Diamond Fibre Company". Strictly speaking, the two Companies were not competitors heretofore, excepting in one small line. While they manufactured material going to the same class of customers, as we have mentioned before, they were not strictly competitive at all. One reason for the strength of the consolidation is due to the very fact that the Companies were complimentary and not competitive. Furthermore, the Diamond State Fibre Company produced several important items of raw materials, such as paper, etc., that The Continental Fibre Company previously had to purchase in the market, so this consolidation provides the manufacture of raw material for the entire consolidated Company."

The Officers of the Company, are as follows: President, J. P. Wright; Vice-President, John M. Taylor, C. L. Bonham, W. R. Yates, L. T. McCloskey, N. N. Wright, Secretary and Treasurer, J. A. Ranck; Assictant Secretary, Robert T. McCracken; Comptroller, G. R. Sinclair.

Gordon Leaves General Plastics

W. STUART GORDON, Jr. - Vice President and Director of General Plastics, Incorporated, has resigned, his resignation taking effect May 15th; to become Vice President and General Manager of Roberts Gas Burner Corporation of Buffalo, New York.

Piperroux With Celluloid Corp.

CELLULOID Corporation announces the appointment of Rene Pierre Piperoux as Superintendent of its Fabricating Department, manufacturing toiletware, novelties, and other articles of "Celluloid". Mr. Piperoux combines with his engineering training at Columbia University rare ability as an artist and designer.

Quigley Lectures at Chemical Exposition

Mr. Leon V. Quigley, Technical Editor of the Bakelite Corporation, lectured on the subject of "Chemical Engineering Application of Phenol Resinous Materials" before the Materials of Construction Group in the Students' Course at the recent Chemical Industries Exposition.

State Chemical Co. Enters Wood Flour Supply For Plastics

Manufacturers of molding compositions using wood flour in their product have a new source for this commodity. The State Chemical Co., which has for the past four years, supplied wood flour only to the unbreakable doll trade is now offering its material to plastics manufacturers as well.

Mr. Louis Herzberg, of the State Chemical Co., who has recently returned from Germany, says that German plastic manufacturers need more wood flour than is produced in that country. He says that he has sold in Germany to this trade the same, uniformly graded material that he is prepared to supply American manufacturers.

G. E. Appoints Eveleth To Textolite Dept.

Mr. W. T. Eveleth has been appointed engineer in charge of Textolite Non-Gear Laminated production by the General Electric Co., Schenectady, N. Y.

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PLASTICS AND MOLDED PRODUCTS ADVISORY BOARD MEETS

THE week of the Chemical Exposition witnessed the informal christening of Plastics new Advisory Board. With only Mr. Rossman and Mr. Stevens unable to accept invitations, a most interesting and enjoyable dinner-meeting was given at the Yale Club on the night of May 8. The historical past, as well as the future, was discussed for the better part of the evening, and plans were made for new and exclusive editorial material. Every member of the Advisory Board is a specialist in his line, and coming articles should prove to be extremely beneficial—and readable. Various outside sources of material were acted upon and it was felt by all of those present that PLASTICS should be the source of all technical papers on the subject of composition industrial since it is the only way to full publicity in the field. At the conclusion of the dinner the members adjourned to the Chemical Exposition where most of them spent the remainder of the evening.

Such frank and informal discussion will do more to increase the value of editorial material than anything else possibly can. Each of the board members is extremely interested in the plastic industry and, perhaps, more fully awake to the future than others. Continued meetings, in such spirit, will more than serve the twofold interest of Plastics in expanding knowledge and advancing the industry, more of them will be held from time to time, and all

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of them will be the source of helpful articles in these pages.

Molded Products At The Chemical Show

(*Continued from page 344*)

To convey the diversity of their products, Durez molded pieces were grouped in a modern setting under the following classifications, packaging, radio, automotive, novelties, homes, industrial and electrical.

The various groups were set off by a Modernistic background, furniture, tables and an unusual floor covering. Attention was attracted by the continuous running message, by the illuminated Runsyne with its ever changing message.

To include reference to each item exhibited is beyond us, but it is sufficient to say that there was included such a range of articles as radio tubes, five different types of clocks, including the Poole electric battery controled, Telechron electric, New Haven Artlarm, Insulation Manufacturing and Norloc desk clocks, thermos jugs, modernistic furniture parts, electric razors, Whiskeeteer and Vibro-Shave which excited tremendous interest, pop guns shooting Durez bullets, inkstands of half dozen manufacturers, including the old and well known line of Senbusch Company, unlimited cigarette, cigar and tobacco novelties; the newest of which is the Toledo Rex Spray Company's "Vogue" lighter, Smoker-set ash receivers and also including the attractive and complete lines of Colt's Patent Fire Arms Company and Schneider Brothers, electric sun lamps, Wurlitzer organ parts, the new and revolutionary Jiffy battery terminal; a phase of automobile development that is a story in itself.

In fact, the exhibit was so ex-

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A Jewel Box Base, molded in our shop, the mold being made in our own toolroom
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tensive in its diversity, those visiting it in the plastic industry were amazed in its magnitude and in the number of new developments in their own business.

Packaging, a comparatively new development in the phenolic field, was well represented and of course it included exhibits of those pioneers, Squibb and Terri, as well as the additional work done by the molders who also pioneered this work, Colt's Patent Fire Arms Company, and Mack Molding Company.

To tell the story of Durez in the automobile business would require an article all by itself but Autolite, Pierce-Arrow, Stewart Warner and their new developed Neon Stop sign and Pass-A-Lite were features recalled in the automotive division of this display.

Prominent among the Durez exhibit were products of Westinghouse, General Motors, Western Electric, Metric Meter, Brown & Bigelow, U. S. Light & Heat, DuPont, Bryant Electric, Trumbull and a long list of others.

Another new development of outstanding interest, was the Durez guard rail, a product of the Twin Coupler Company of Poughkeepsie, N. Y. This new development of impregnated paper stock is made in a wide range of colors and has a beautiful finish and a warmth that is particularly appealing. This material is not only useful for guard rails but has already found a long list of possible markets.

Karolith

Color was the keynote of the Karolith Corporation's exhibit of casein plastics. They certainly made the most of the color possibilities that this remarkable material possesses and used them, for one thing, to decorate their booth in a very characteristic fashion.

In the center of the booth, on a low round table, was stacked a huge bundle of rods containing every color in the rainbow. Lighted from below, it couldn't help but impress the visitor that

here was a material that could solve any color problem. A further examination of the booth and the many articles on display there, bore this first impression out. For there were clocks cases, lamps-bases, lamp shades, inkstands, ash trays, and a host of others, gotten out in a luxuriant array of colors and combination color effects. This was true of the molded articles as well as the pieces machined from sheets and rods. The Karolith booth was a Mecca which drew to it the true believers in color.

Miner Laboratories

Being the largest source of furfural and its derivatives, the Miner Laboratories had a very interesting exhibit. Apart from these raw materials, from which furfural resins are made, they showed some interesting molded pieces made from Durite, the product of Stokes and Smith and some pieces molded by the Simmons Company. Most noteworthy among these were casters for beds molded in green and brown and a table top molded entirely in one solid piece.

The Cleveland Fire

(*Continued from page 348*)

a satisfactory non-inflammable thermo plastic material and it is felt that in their new product, Lumarith, they have accomplished their objective. This recent development has resulted in a cellulose acetate plastic offering a full range of colors, both opaque and transparent, so that practically all effects with all the desirable working characteristics of celluloid, but without its highly inflammable character may now be obtained in a slow burning or practically non-inflammable material.

The use of this material is expected to result in the removal of much of the hazard now present in the pyroxylin plastic industry as well as in the X-ray and moving picture film fields. Many municipalities have introduced ordinances regulating the use and storage of X-ray films and unquestionably as a re-

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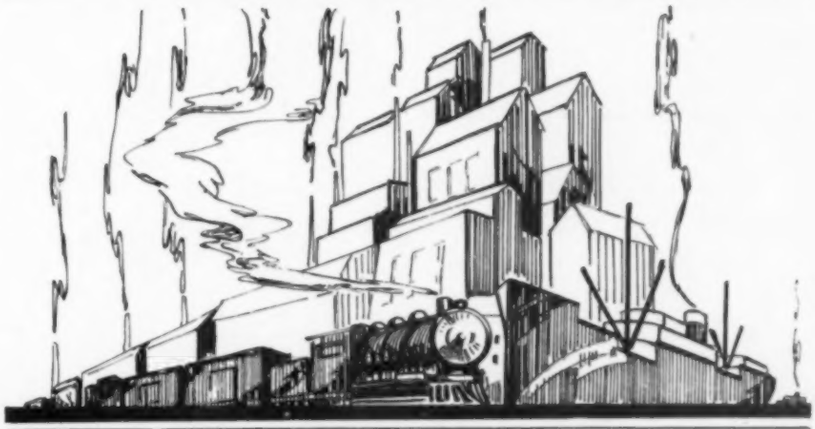
Norloc engineers will be pleased to co-operate with your business and suggest changes that will enable Norloc to modernize your product. Write to them to-day.



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Say you saw it in PLASTICS

Exports of United States Pyroxylin Products, By Countries
February, 1929

Countries	Sheets, rods, or tubes		Manufactures	
	Pounds	Dollars	Pounds	Dollars
Belgium	.....	.....	24,549	985
Germany	2,527	3,065	168	328
Irish Free State	67	125	.....	.....
Spain	.....	.....	428	1,611
United Kingdom	58,570	51,565	55,295	21,136
Canada	135,702	98,710	12,677	24,449
Guatemala	24	25	94	440
Honduras	.....	.....	15	134
Nicaragua	.....	.....	63	182
Panama	.....	.....	125	261
Salvador	.....	.....	68	366
Mexico	255	249	4,195	7,225
Newfoundland & Labrador	.....	.....	52	103
Cuba	61	44	3,204	4,176
Neth. W. Indies	.....	.....	22	140
Haiti, Republic of	.....	.....	59	138
Argentina	.....	.....	42	105
Brazil	56	38	35	148
Chile	67	59	2	12
Colombia	.....	.....	19	180
Ecuador	16	23	.....	.....
Peru	91	103	10	50
Venezuela	424	453	131	686
B. India	13	50	.....	.....
China	.....	.....	172	340
Java & Madura	.....	.....	10	42
Japan	3,614	5,499	.....	.....
Philippine Islands	193	183	2,037	2,628
Australia	15,369	10,549	5,607	4,012
New Zealand	220	162	527	304
Union of South Africa	6	14	665	620
Other B. S. Africa	.....	.....	6	56
Total	217,275	170,907	110,277	70,857
Shipments from U. S. to:				
Hawaii	.....	.....	1,165	853
Porto Rico	.....	.....	58	162

sult of this recent disaster many more will follow extending their supervision to all fields of cellulose nitrate products. Home moving pictures have been made possible through the use of Cellulose Acetate film, which eliminates the need of a fireproof projection booth, at it removes the hazards attendent with the use of nitro cellulose films. With these precedents set in the film industry, it would appear to be only a matter of time before similar conditions must be faced in the plastic field.

The possibility of some such action makes it increasingly important for each maker and user of nitrocellulose products to keep his plant a model of safety from the fire standpoint, avoiding accumulation of excess raw material or scrap, providing whatever protective measures are possible, and educating all his employees in the safe handling of inflammable materials. He should in addition look at the

future with considerable confidence, in view of the fact that the industry is in a position to insure his continuance in the cellulose thermoplastic field in that it is able to offer to him, in the event that it becomes necessary, a cellulose thermoplastic possessing practically all the properties on which his business is built but meeting the trend of the times in that he can now add his products to the steadily growing list of those already classed as in the safety field.

Erratum

IN a recent issue of Plastics and Molded Products, in which the British Industries Fair was described, reference to the stand of H. E. Ashdown Ltd., Birmingham, England, was omitted, in error. This company, which had one of the largest individual exhibits of synthetic resin moldings, does custom molding for the electrical, motor car, radio, novelty, photographic and button trades.

Luxite Molding Powder

(*Continued from page 350*)

toise shell, etc. Pastel shades include: red, pink, canary yellow, onyx, green, royal blue, etc. Inasmuch as the base of Luxite is perfectly colorless practically any color effect can be matched.

The unusual strength is of importance in the novelty field, where delicate, translucent colors are usually associated with fragility, or other objectionable features not found with Luxite molded articles.

The photographs reproduced herewith show a few of the uses to which American molders are putting Luxite." Unfortunately the delicate coloring is lost in a black and white reproduction and should be actually seen in order to appreciate its true values.

It is safe to judge that such a material is destined to play a very important part in the development of the molding industry in the next few years.

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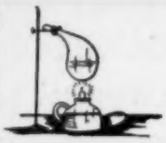

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